



BREAKING OUT OF THE SNOW CAVE

The significance of colour in healthcare environments

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ROYAL COLLEGE OF PHYSICIANS LONDON | 11-14 JUNE 2017

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MAGGIE'S

Dear colleagues,

We are delighted to welcome you to the 3rd European Healthcare Design 2017 Congress & Exhibition, incorporating the annual members-only seminar of the International Union of Architects' Public Health Group (UIA-PHG) and Global University Program in Healthcare Architecture (GUPHA), here in the beautiful venue of the Royal College of Physicians.

Providing an international forum for researchers, policymakers and practitioners to explore the relationship between health service design, technology and the built environment, the congress is now in its third year. The success is a testimony to the talent, knowledge and hard work of its chair and Architects for Health' programme director, Susan Francis, who passed away peacefully six weeks ago.

Respected worldwide for her dedication over many decades to healthcare design, Susan's ideas thread through every fibre of European Healthcare Design, and she is greatly missed. A full eulogy to Susan's life and work is published on pages 6-7. We also invite you to stay until the end of the Awards ceremony on Tuesday 13 June, when a short presentation will be given to recognise Susan's immense contribution.

This year's congress theme, 'Visioning the future: Designing for change in people-centred health systems', reflects Susan's lifelong work to promote the importance of architecture and the physical environment in the creation of 'compassionate, integrated care systems, designed to allow patients to be active participants and true partners in their health and wellbeing'.

Healthcare in the 21st century presents huge challenges and opportunities. Science, technology and medical advances are accelerating the pace of change, as we embark on a paradigm shift in pharmacology and diagnostics that requires fundamental changes in the provision of care. Meanwhile, nanotechnology is moving from research to application, and our new knowledge of how the brain works is blurring the boundaries between neurosciences and psychology. The rapid advances and convergence of medical science and information technology have provided us with the tools for system and service redesign, and have transformed diagnosis and treatment. This, in turn, has redefined building typologies.

This year's congress will explore how to effectively design for the adoption of new science, technology and innovation with compassion and empathy for the patient and human experience.

Organised by Architects for Health and SALUS Global Knowledge Exchange, in collaboration with our host, the Royal College of Physicians, our partners and sponsors, we are delighted to welcome you to London.

In addition to a two-day conference programme with eight streams featuring expert speakers from across the globe, the event will also host a welcome drinks reception (p37), an exhibition of the latest design solutions (p196-206), a garden party (p37), study tours (p38-41) of some of the UK's most innovative new health facilities, and an international awards programme (p42-53).

We look forward to your participation in this exciting congress and to working with you to create and share new knowledge around the value of design in transforming services and infrastructure, and in improving the quality of healthcare in Europe and around the world.

**CHRIS SHAW**

Chairman
Architects for Health

**JOHN COOPER**

Past Chairman
Architects for Health

**MARC SANSOM**

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**Sir Robert
McALPINE**

Dear friends and colleagues,

Maggie's is delighted to be here at the Royal College of Physicians, participating as the official charity partner of the 3rd European Healthcare Design 2017 Congress & Exhibition.

Partnerships such as these are crucial to Maggie's work, as we seek to deliver the highest quality people-centred support for those living with cancer. Our relationships with the NHS, charities, architects and providers – and our supporters and partners – enable Maggie's to blaze a trail for people living with cancer, and their families and friends.

With advances in medicine and earlier diagnosis, the chances of long-term survival of cancer are double those of 40 years ago. There are now more than 2 million people in the UK who have survived a cancer diagnosis. As the number of people affected by the disease rises, so does the need to provide practical and emotional support to help people cope with the challenges that living with and beyond cancer brings.

At Maggie's, we provide free practical, emotional and social support for people with cancer, and their family and friends, following the cancer care blueprint originally laid out by Maggie Keswick Jencks. Although facing terminal cancer, Maggie was determined that nobody should lose the joy of living through the fear of dying. She aspired to provide a welcoming place, near the hospital, where cancer support was available free of charge to everyone.

Since the first Maggie's Centre opened in Edinburgh 20 years ago, there are now 20 facilities across the UK and in Hong Kong and Tokyo. Visitors to these centres find a warm, welcoming and tranquil place with specialist staff dedicated to their physical and emotional wellbeing. There are many reasons to visit Maggie's: people recently diagnosed come for expert advice; others go for help on how to get their lives back on track once their treatment is complete; children visit to learn more about what's happening to mum or dad; and families come seeking caring support to cope with the loss of a loved one.

We've been fortunate to receive the support of world-leading architects, including Sir Norman Foster, the late Dame Zaha Hadid, and Sir Richard Rogers, in creating highly individual designs for each centre that embrace the Maggie's philosophy and illustrate how the built environment is fundamental in enhancing the wellbeing of people with cancer. These incredible settings enable us to provide expert support for more than 220,000 visitors every year.

Maggie's is funded entirely by charitable donations from inspirational supporters and partners. Their help enables us to continue to grow and build exciting new centres, such as those planned at St Bartholomew's Hospital in London, The Royal Marsden in Surrey, and Southampton General Hospital. Our ultimate goal is to reach everyone affected by cancer in the UK who needs our support.

To learn how you can support Maggie's, please get in touch at corporate@maggiescentres.org. We would love to hear from you.

I wish you all a productive and inspirational Congress.

Best wishes

Laura Lee,
Chief Executive
Maggie's



SUE FRANCIS – EULOGY

Sue Francis was a determined pioneer, whose achievements as a woman, architect, educator, writer and strategist are woven, in no small way, into many of our lives. Sue was an amazing person to work with, always generous with her knowledge and expertise while sensitive, clear and very organised. She drew on a multitude of skills and cultures, which allowed her to work across disciplines very successfully.

She also had a rich personal hinterland and so many of us who attended her funeral were surprised and gladdened to find out about an interest or skill that Sue possessed, of which we knew little. Sue designed her own clothes; she designed and built her house in Shepherdess Walk along with friends who became family, raising their children together under one roof. It's fair to say she also designed her singular career path and guided those of many others.

History will judge Sue kindly because she was right about so many of the big issues in healthcare strategy and design. The book she co-wrote in 2000 for the Nuffield Trust – *Building a 2020 Vision: future healthcare environments* – set out a 20-year development strategy for the NHS, a design primer, and an approach that grounded these in the context of broader social and public health structures. It identified and addressed virtually every element that forms the current debate around healthcare provision and reform. Had politicians and strategists followed her precepts, the country would now be in much better health.



Like many of her peers, Sue began her professional life in the co-operative movements of the late 70s and early 80s, and she was a founder member of the Matrix Feminist Design Cooperative, working across disciplines as an architect, enabler, writer and occasional political firebrand. In 1986, she left to live in Delhi. Following the birth of her three children, Sue ran a course in 'Women in Architecture and Building', and then, in 1991, joined the staff of the Medical Architecture Research Unit (MARU).

In Thatcher's Britain, many on the political left took refuge in academia or embraced private practice. Her career change could have gone wrong; this was a time of turmoil for MARU, as funding was scarce and the unit's leadership had left. It could have also ended in academic sterility, but Sue, with Rosemary Glanville, secured the future of the course and, under their leadership, the unit flourished to provide a generation of NHS and international students with a special education. In so doing, Sue built a reputation as a highly effective advocate for design quality in healthcare and moved to the national stage. She drew on a multitude of skills and cultures, which allowed her to



work across disciplines very successfully. She was a brilliant chair and a very effective organiser with a network of contacts across the world.

After 15 years, Sue stepped down from her day-to-day involvement and joined CABE, heading its healthcare design team at a time when billions were being invested annually in capital projects. She also joined the Future Health Network at the NHS Confederation as design lead, working with Sylvia Wyatt on developing a learning network and a knowledge base to integrate health system design and architecture.

It was a time of over-rapid and often ill-considered development, which Sue had foreseen and warned against in *Building a 2020 Vision*. Nonetheless, she excelled in these roles and succeeded in mitigating or overturning many poor decisions. Indeed, she secured the role of CABE as an essential component in the design process, improving the quality of a host of projects.

Sue had been involved in Architects for Health (AfH) from its earliest days. In 2011, she was invited to become its programme director. She brought all her skills to bear and turned AfH around, galvanising the committee and creating the successful organisation you see today. Her last five years were tough, but her inner strength proved tougher, and she calmly dealt with everything that her illness and fate flung her way with equanimity and her faith in the power of the human intellect.

The European Healthcare Design Congress is one of several fitting memorials to her vision, the network of contacts and bonds of friendship she had developed across Europe, and her ability to bring people together in a common cause.

Sue will be remembered by her three sons, by the whole extended family of Shepherdess Walk, and by many friends and colleagues across the world.

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The **Senator** Group



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THE ROYAL COLLEGE OF PHYSICIANS

The third European Healthcare Design Congress & Exhibition, 11–14 June 2017, will, once again, be held at the prestigious headquarters of the Royal College of Physicians (RCP) in London.

Since its foundation in 1518, the RCP has had five headquarters in London. The current Grade 1 listed building in Regent's Park was designed by architect Sir Denys Lasdun and opened in 1964. Considered a modernist masterpiece, it is one of London's most important post-war buildings.

In 1992, Sir Lasdun was awarded the Royal Institute of British Architects' Trustee Medal in recognition of his work at the RCP, considered to be "the best architecture of its time anywhere in the world".

Sir Lasdun won the competition to design the new headquarters in 1959. He was surprised at being asked to design for such a traditional body, given his modernist philosophy, and he made it clear that he would not create a classical-style building. Ultimately, he responded to the challenge with a skilful integration of centuries-old traditions and his own vision.

As an award-winning and highly versatile venue for conferences, meetings, banquets, training and outdoor events, the building has an atmosphere of space and light, with stylish, modern architecture and a selection of both old and new styles to suit all tastes.

The venue offers:

- **A central London location** – overlooking Regent's Park, with good access to road, rail and tube.
- **Magnificent conference and banqueting facilities** – tiered auditoriums, exhibition space, event and dining facilities, including the stunning Council Chamber and the 'jewel in the crown' – the Dorchester Library.
- **An award-winning Grade 1 listed modern building** – an atmosphere of space and light with a contrasting mix of old and new facilities.
- **A rare heritage collection** – with over 500 years of history and more than 50,000 antiquarian books.
- **High-quality food and service** – eclectic cuisine, bespoke menus and first-class service.
- **A professional venue for international conferences** – a member of Unique Venues of London, International Association of Conference Centres, and London and Partners, to name a few.
- **A private 'Physic Garden' for events** – filled with rare plants and flowers from all over the world, suitable for barbecues, receptions and al fresco dining.
- **A professional and friendly events team** – dedicated event managers, catering experts and technicians. Full support is provided before, during and following events.





GROUND FLOOR

Wolfson Theatre

- Main conference plenary sessions, breakout sessions and EHD2017 Awards presentation

Council Chamber

- Breakout sessions and workshops

Linacre Room

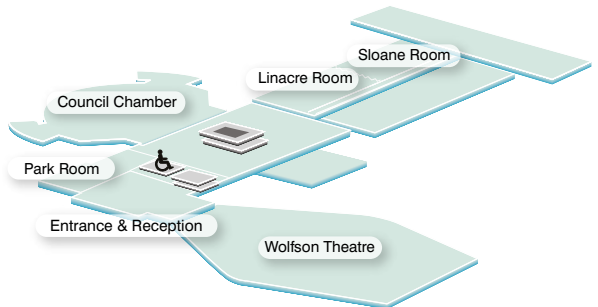
- Breakout sessions

Sloane Room

- Breakout sessions

Park Room

- Organisers' office



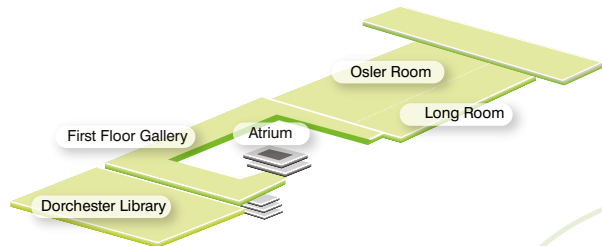
FIRST FLOOR

Dorchester Library

- Poster gallery and EHD2017 Awards shortlist gallery

Long Room and Osler Room

- Lunch, Exhibition and Welcome Drinks Reception



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Tracey Wain, Deputy Director of Capital Investment and Facilities

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International Union of Architects' Public Health Group (UIA-PHG) annual meeting

11 June 2017

This year, the European Healthcare Design Congress & Exhibition 2017 incorporates the annual members-only seminar of the International Union of Architects' Public Health Group (UIA-PHG) and Global University Program in Healthcare Architecture (GUPHA).



09.00	Opening and formal welcome Warren Kerr (Australia), director, UIA-PHG
09.05	Healthcare design spaces Cliff Harvey (Canada)
09.20	CICU patient perspectives on healing environment (2006–2014): a qualitative exploratory study Astrid Maria Debuchy (Argentina)
09.40	Healthy planet. Healthy people: building a global knowledge community Marc Sansom (UK)
10.00	BREAK
10.20	Evolution of infectious ward design of Malaysia: case study Norwina Nawawi (Malaysia)
10.40	The spectrum of need for community mental healthcare, the problems encountered in service delivery, and approaches for service and environmental redesign Philip Sun (USA)
11.00	"I have a dream (hospital) – but how can I afford it?" Karin Imoberdorf (Switzerland)
11.20	Designing in context – differing clinical cultures John Cooper (UK)
11.40	Keeping the bugs at bay Ruby Lai (Singapore)
12.00	WORKING LUNCH
12.20	A hospital architect is more than a designer – challenges and chances for UIA-PHG members and colleagues Henning Lensch (Germany)
12.40	Parents' insights about the built environment for new autism and other disabilities center in Fishers, Indiana Shireen Kanakri (USA)
13.00	Inter-professional collaboration and the design of health projects Jane Carthey (Australia)

13.20	New OCADU Design for Health programme Gayle Nicoll (Canada)
13.40	Activities of our UIA-PHG Group in France Placeholder: Thomas Schinko / David Entibi (France)
14.00	BREAK
14.20	Microclimatic design and outdoor places for seniors Eric Bardenhagen (USA)
14.40	Reflections on 20 years in hospital planning and delivery in Queensland Kate Copeland (Australia)
15.00	Towards a vision of 'the hospital of tomorrow' Didier Bourdon (France)
15.20	Planning the efficiency of emergency departments' spatial design – simulating clinical workflows and capacity planning Giuseppe Lacanna (Netherlands)
15.40	Integrating design, learning and research: the RIPCHD.OR ambulatory surgery prototype project in architecture + health at Clemson University David Allison (USA)
16.00	BREAK
16.20	New research and design projects at Texas A&M University George Mann (USA)
16.40	UIA-PHG Student and Young Architects Competition Zhipeng Lu (USA)
17.00	2018 UIA-PHG annual meeting announcement (2018 host: France)
18.00	CLOSE
19.00	Dinner



08.00 REGISTRATION OPENS



Session 1

Strategies and perspectives on global health systems

Chair: Andy Black, Durrow Health Services Management, New Zealand/UK

08.45 **Welcome and introduction**

Chris Shaw, Chair, Architects for Health, UK

09.00 **Keynote address: Citizens' views of health services around the world**

Bobby Duffy, Managing director, Ipsos MORI, UK

09.30 **Keynote address: Tackling wasteful spending to improve health system performance: an international perspective**

Agnès Couffinhal, Senior economist, OECD, France

10.00 **Panel discussion**

10.15 **COFFEE, EXHIBITION AND POSTER GALLERY**



Session 2

The hospital in the city

Chair: John Cole, Queen's University Belfast, UK

10.45 **Addressing London's health and housing crisis by design**

John Cooper, Director, John Cooper Architecture, UK

11.05 **From wounded city to healing environment**

Willemineke Hammer, Partner, EGM architects, Netherlands

Liesbeth van Heel, Project manager, Directorate of Corporate Real Estate, Erasmus MC, Netherlands

11.25 **A vision for the future of modular hospital design: structure and setting**

Edzard Schultz, Partner, Heinle, Wischer and Partner, Germany

Eva Henrich, Architect – healthcare architecture, Heinle, Wischer and Partner, Germany

11.45 **The Danish patient: a comparison of the architectural structures of hospitals in the 1960s, 1970s and in 2020 in Denmark**

Susanne Glade, Architect, GO+ architekten, Germany



12.05 **Panel discussion**

12.30 **LUNCH, EXHIBITION AND POSTER GALLERY**

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Session 3

New models of care and the patient experience

Chair: Jane McElroy, NBBJ, UK

14.00 Cancer Centre at Guy's Hospital: the patient voice – is the design better because of it?

Catherine Zeliotis, Healthcare leader,
Stantec, UK

Dr Majid Kazmi, Clinical director, haematology and
cellular pathology, Guy's and St Thomas' NHSFT, UK

Alastair Gourlay, Programme director – asset
management, Guy's and St Thomas' NHSFT, UK

Diana Crawshaw, Chair, Patient Reference Group,
Guy's and St Thomas' NHSFT, UK

14.20 The art of care – integrated art and design at the New QEII Hospital

Jacqui Bunce, Associate director,
East and North Hertfordshire CCG, UK

Louisa Williams, Director,
Art in Site, UK

Mark Rowe, Partner,
Penoyre & Prasad, UK

14.40 The Bispebjerg human hospital patient experience: designing a new Danish standard

Kyle Basilius, Senior associate
and medical planner, EYP Health,
USA

Mikkel Beedholm, Principal
and senior designer, KHR
Arkitekter, Denmark

Berit Steenstrup Damm,
Vice-president of finance and
process, Bispebjerg Hospital,
Capital Region of Denmark

15.00 Panel discussion

15.30 COFFEE, EXHIBITION AND POSTER GALLERY



Session 4

Art and design for women and children

Chair: Chris Liddle, HLM Group, UK

16.00 Taking the "ouch!" out of emergency: using illustrative and digital arts to guide, reassure and role-model behaviours at the Children's Emergency Department, Evelina London Children's hospital

Martin Jones, Director,
Art in Site, UK

John Criddle, Consultant in children's emergency
medicine, Evelina London Children's Hospital, UK

16.20 Case study at HM Nuevo Belén Hospital in Madrid – comparing two different healthcare concepts in the same maternity building

Angela Elisabeth Müller, Architect, Parra-Müller
Arquitectura de Maternidades, Spain

Marta Parra Casado, Architect, Parra-Müller
Arquitectura de Maternidades, Spain

16.40 Panel discussion

Session 5

Keynote plenary

17.00 Keynote address: Maggie's Cancer Caring Centres – the value of design in maintaining the joy of life for people living with cancer

Laura Lee, Chief executive, Maggie's, UK

17.45 Closing remarks

18.00 EXHIBITION, POSTER GALLERY AND WELCOME DRINKS RECEPTION

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**Sir Robert
McALPINE**

Stream 2 begins at 10.45, after the early morning plenary session (08.45–10.15) in the Wolfson Theatre.



Session 6

Policy and practice: designing for older people

Chair: Sylvia Wyatt, Age UK Isle of Wight, UK

10.45 **Strategies for tackling the super-ageing process in a welfare society. Policymaking, welfare technology and refurbishments in the Sweden of 2040**

Jonas Andersson, Architect and expert advisor, School of Architecture, Department for Architecture and Built Environment, KTH Royal Institute of Technology, Sweden

11.10 **Development and test of a methodology for the investigation of stroke patients' rehabilitation in home settings**

Elizabeth Marcheschi, Post-doctoral researcher, architecture, building and design, Chalmers University of Technology, Sweden

Marie Elf, Associate professor and senior lecturer, School of Education, Health and Social Studies, Dalarna University, Sweden

11.35 **Making frailty a priority: experiences of an innovative GP-led multidisciplinary approach to frailty within secondary care**

Dr Cat Roberts, GP, Coventry & Rugby GP Alliance, UK

Dr Ben Atkins, GP, Coventry & Rugby GP Alliance, UK

12.00 **Panel discussion**

12.30 **LUNCH, EXHIBITION AND POSTER GALLERY**

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12.45- **Lunchtime Design Workshop – Part 1**

13.45 **Know and engage your user: empathy and co-design in healthcare**

Organised by:



Presenters: Caroline DeWick, Beth Zacherle, Joel Worthington, David Grandy, HDR, USA

**Session 7**

Architecture and urban design for elder care

Chair: Jonathan Wilson, Stantec, UK

14.00 Colloquium: Urban elder care – case study 1: New Sølund, Denmark

Rolf Nielsen, Associate partner, C.F. Møller, Denmark/UK

14.15 Colloquium: Urban elder care – case study 2: Drøbak, Norway

Scott Grady, Director, Haptic Architects, Norway/UK

14.30 Colloquium: Urban elder care – case study 3: HomeFarm project, Singapore

Chris Liddle, Chairman, HLM Group, UK

Richard O'Neil, Director, HLM Group, UK

14.45 Colloquium: Urban elder care – case study 4: Heather Street project

Ray Pradinuk, Principal architect, Stantec, Canada

15.00 Panel discussion**15.30 COFFEE, EXHIBITION AND POSTER GALLERY****Session 8**

Inclusive design for ageing communities

Chair: Warren Kerr, UIA-PHG, Australia

16.00 Design for building an engaged, inclusive and resilient residential aged-care workforce

Dr Lucio Naccarella, Senior research fellow, Health Systems and Workforce Unit, University of Melbourne, Australia

16.20 Designing a strategic masterplan for age-inclusive communities

Simon Butler, Associate, Arup, UK

16.40 Panel discussion

Stream 2 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and keynote address.

Stream 3 begins at 10.45, after the early morning plenary session (08.45–10.15) in the Wolfson Theatre



Session 9
Population health, big data and design
Chair: Katie Wood, Arup, UK

10.45 Technological advances and the healthcare estate

Patrick Van den Bergh, Head of healthcare,
Watkins Gray International, UK

Geof Beesley, Partner, Fusion, UK

11.15 The impacts of population health analytics on hospital and outpatient clinic designs

Christine Chadwick, National senior director,
infrastructure solutions, GE Healthcare, Canada

Daniel Zikovitz, Solutions architect, GE Healthcare,
Canada

11.45 Best practice for implementing integrated technologies in healthcare

Katie Wood, Director operations consulting, Arup, UK

12.10 Panel discussion

12.30 LUNCH, EXHIBITION AND POSTER GALLERY

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Session 10
Co-design and innovation to transform services
Chair: Peter Frost, Chalmers University of Technology, Sweden

14.00 Innovation and the New Alder Hey

David Powell, Development director,
Alder Hey Children's NHS Foundation Trust, UK

Rafael Guerrero, International lead – innovation
/ cardiac surgeon, Alder Hey Children's NHS
Foundation Trust, UK

14.25 Case study: Sahlgrenska University Hospital Imaging & Intervention Centre

Gunnar Linder, Regional director healthcare,
Sweden, WSP, Sweden

Niclas Malmeling, Västfastigheter,
Sweden

14.50 CArE delivered with Telemedicine to support Rural Elderly and Frail patients (C@RTREF – Welsh for 'Home'): co-designing responsive services with patients in rural healthcare as part of the Future Hospital Programme in Wales

Dr Salah Elghenzai, Consultant geriatrician, Betsi Cadwaladr University Health Board, Wales, UK

15.15 Panel discussion

15.30 COFFEE, EXHIBITION AND POSTER GALLERY

**Session 11**

Human-centred design for care

Chair: Jonathan Erskine, European Health Property Network, UK

16.00 **Sound and acoustics in healthcare facilities****Mai-Britt Beldam**, Central concept developer – healthcare, Saint-Gobain Ecophon, Sweden

16.20 Emotional design for a healthcare robot and its app**Yegor Tsynkevich**, Creative director, 415Agency, USA

16.40 Panel discussion



Stream 3 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and keynote address.

Stream 4 begins at 10.45, after the early morning plenary session (08.45–10.15) in the Wolfson Theatre.



Session 12 **Sustainably transforming health infrastructure** Chair: Simon Kydd, WSP UK

10.45 Transforming our healthcare estate: developing a health campus solution for Townlands Hospital, Henley

Mike Leto, Bid director, Amber Infrastructure, UK

11.10 The efficient health system of the future

John Kelly, Director, healthcare planning, Essentia, UK

11.35 Holistic healthcare design and why it matters

Beth Zacherle, Strategic innovation designer, HDR, USA

Joel Worthington, Strategic innovation designer, health, HDR, USA

Cliff Harvey, Vice-president, planning and facilities and support services, North York General Hospital, Canada

12.00 Panel discussion

12.30 LUNCH, EXHIBITION AND POSTER GALLERY

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Session 13 **Partnering to design a people-centred NHS** Chair: Stephanie Williamson, Great Ormond Street for Children NHS Foundation Trust, UK

14.00 Sustainable by design

Dale Sinclair, Director of technical practice, architecture, EMIA Buildings + Places, AECOM, UK

14.20 A specialist children's hospital with play in its heart and art in its soul

Claudia Bloom, Director – architecture/healthcare, Avanti Architects, UK

Mary Reid, Senior interior designer – interior design/healthcare, Avanti Architects, UK

14.40 Hopewood Park – an 11-year collaboration

Paul Yeomans, Director, Medical Architecture, UK

Chris Shaw, Senior director, Medical Architecture, UK

15.00 Panel discussion

15.30 COFFEE, EXHIBITION AND POSTER GALLERY

**Session 14**

Technology, design and construction management

Chair: Cliff Harvey, UIA-PHG, Canada

16.00 Addressing the risks of major construction activity on a working acute hospital site

Crispin Walking-Lea, Head of healthcare planning, development and property services,
Great Ormond Street Hospital for Children NHS Foundation Trust, UK

16.20 From P21+ Repeatable Room and Standard Component iPad and web application to P22 VR hospital

Rosemary Jenssen, Director, Jenssen
Architecture; P21+/P22 healthcare design advisor,
Kier; and P22 EPP Working Group lead, UK

Pat Pemberton, Senior health consultant,
Interserve Consulting; P22 Working Group
member, UK

16.40 Panel discussion

Stream 4 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and keynote address.

08.00 REGISTRATION OPENS



Session 15

What the future holds

Chair: John Cooper, John Cooper Architecture, UK

08.55 Chair's welcome

09.00 Co-creating knowledge where art and science collide

Daniel Glaser, Director, Science Gallery London, King's College London, UK

09.30 The 100,000 Genomes Project: the start of personalised medicine

Vivienne Parry, Head of engagement, Genomics England, UK

10.00 Panel discussion

10.30 COFFEE, EXHIBITION AND POSTER GALLERY



Session 16

Designing healthy and sustainable communities

Chair: John Hicks, AECOM, UK

11.00 Creating healthy communities – insights from the NHS' Healthy New Towns Programme

Mario Bozzo, Director, design and technology, IBI Group, UK

Sara McCafferty, Senior strategy programme manager, NHS England, UK

11.20 Herston Quarter Redevelopment: supporting new models of care through positioning, partnering and placemaking

Adam Davies, Principal, planning and urban design, HASSELL, Australia

Kate Copeland, Chair, Australian Health Design Council; Fellow and Queensland vice-president, Australasian College of Health Service Management, Australia

11.40 New models of healthcare, design and architecture: how Markham Stouffville Hospital was transformed into an integrated wellness community

Bill Nankivell, CEO, B+H Architects, Canada

12.00 Panel discussion

12.30 LUNCH, EXHIBITION AND POSTER GALLERY

Supported by:



**Session 17****Music, technology and design for aged care****Chair: Sasha Karakusevic, NHS Horizons, UK****14.00 Using bus passes to create personal data stores to streamline health and care services****Sylvia Wyatt**, Advisor, Age UK
Isle of Wight, UK**Christopher Curry**, Director, General Information
Systems Ltd (GIS), UK**14.20 Living with dementia: the role of music therapy and approaches to reduce social isolation and behavioural challenges****Dr Liz Paslawsky**, International health business consultant, UK/Australia**14.40 Extra care for older people – settings that value relationships****Peter Lacey**, Director, Whole Systems
Partnership, UK**Elaine McNichol**, Director of CPD4 Health
Innovation, School of Healthcare Studies,
University of Leeds, UK**15.00 Panel discussion****15.30 COFFEE, EXHIBITION AND POSTER GALLERY****Session 18****Hospitals without walls at the frontline of care****Chair: Bas Molenaar, Technical University Eindhoven, Netherlands****16.00 Clinic 20XX: understanding consumers, continuums and change-readiness****Upali Nanda**, Director of research, HKS, USA**Jane Ho**, Healthcare design director, HKS, UK**16.20 XXS-H Kiosk: design research into the smallest bit of institutional healthcare in Singapore****Ruzica Bozovic Stamenovic**, Associate professor, National University of Singapore, Singapore**16.40 Panel discussion****Session 19****Closing session****Chair: Christopher Shaw, Architects for Health, UK****17.00 European Healthcare Design Awards 2017**

Organised by Architects for Health with SALUS Global Knowledge Exchange, the awards aim to set new standards in the creation of healthcare environments that promote health and wellness, support the delivery of treatment and care in an accessible, economic and equitable way, and embed quality improvement.

Supported by (Lead sponsor):

**17.45 Closing remarks****18.30 GARDEN PARTY**

07.30-08.45 **Breakfast Workshop**
How next-generation public private partnerships can unlock the power of NHS transformation

Organised by:



Presenter: Graham Spence, Commercial director, Community Health Partnerships, UK

Stream 6 begins at 11.00, after the early morning plenary session (08.55–10.30) in the Wolfson Theatre.



Session 20
Radically rethinking the future hospital
Chair: Christopher Shaw, Architects for Health, UK

11.00 **Designing a very different hospital**

Andy Black, Chairman, Durrow Health Services Management, New Zealand/UK

11.20 **Re-activate! Create an activating patient environment by creating a non-bed-centric environment**

Roelof Gortemaker, Architect director, dJGA Architects, Netherlands

11.40 **Designing flexibility for the future through lean operational planning with the incorporation of technology and art**

Marvina Williams, Senior operational planner / Lean Black Belt, Perkins+Will, USA

Jean Mah, Healthcare practice leader / principal, Perkins+Will, USA

12.00 **Panel discussion**

12.30 **LUNCH, EXHIBITION AND POSTER GALLERY**

Supported by:



12.45-13.45 **Lunchtime Design Workshop – Part II**
Design thinking: creative approaches to tackling today's health challenges

Organised by:



Presenters: Jonathan West, Elizabeth Raby, Ela Neagu and Ed Matthews, Helen Hamlyn Centre for Design, Royal College of Art, UK

**Session 21****Designing for emergency and critical care**

Chair: Philip Astley, UCL Bartlett School of Construction and Project Management, UK

14.00 Critical care design – design competition winners and future trends

Charles Cadenhead, Senior principal, healthcare, EYP Health, USA

14.20 Emergency talks – design for staff communication in emergency departments

Kieren Morgan, Principal, healthcare sector, HASSELL, UK

Michaela Sheahan, Researcher, knowledge and sustainability, HASSELL, Australia

Dr Bernice Redley, Associate professor, Centre for Quality and Patient Safety Research, Monash Health Partnership, Deakin University Monash Medical Centre, Australia

Dr Lucio Naccarella, Centre for Health Policy, Melbourne School of Population and Global Health, University of Melbourne, Australia

14.40 Intensive care unit: work in progress

Clara Rius, Architect, Estudi PSP Arquitectura, Spain

15.00 Panel discussion
15.30 COFFEE, EXHIBITION AND POSTER GALLERY
**Session 22****User-based design methods in the hospital planning process**

Chair: Marte Lauvsnes, Sykehusbygg, Norway

16.00 Usability briefing for hospital architecture – exploring user needs and experiences to improve complex buildings

Aneta Fronczek-Munter, Post-doctoral researcher, NTNU – Norwegian University of Science and Technology, Norway

16.20 Service users' involvement in the planning of a new psychiatric hospital

Minna Laitila, Director of nursing, Hospital District of South Ostrobothnia, Finland

16.40 Panel discussion

Stream 6 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and presentation of the European Healthcare Design Awards 2017.

Stream 7 begins at 11.00, after the early morning plenary session (08.55–10.30) in the Wolfson Theatre.



Session 23

Sustainability, wellness and climate change

Chair: Ruzica Bozovic Stamenovic, National University of Singapore, Singapore

11.00 Healthcare evolves from sustainability to wellness

Richard Rome, Executive vice-president – healthcare, WSP, USA

11.20 Healthy planet. Healthy people: building a global knowledge community to improve planetary health

Marc Sansom, Director, SALUS Global Knowledge Exchange, UK

11.40 Healthcare facilities at disaster and rescue zones: characteristics and future developments

Noemi Bitterman, Director, Medical Design Programme, Technion, Israel Institute of Technology, Israel

12.00 Panel discussion

12.30 LUNCH, EXHIBITION AND POSTER GALLERY

Supported by:



Session 24

Biophilic design to promote health and wellness

Chair: David Grandy, HDR, USA

14.00 Singapore's Khoo Teck Puat Hospital: biophilic design in action

Giovanni Cossu, Research associate and sustainable design manager, School of Design and Environment, Department of Architecture, National University of Singapore, Singapore

14.20 Healthcare design: an extension of the natural and built environment

Dr Omniya El Baghdadi, Project co-ordinator, Queensland University of Technology, Australia

Katharina Nieberler-Walker, Principal and head of landscape architecture, Conrad Gargett, Australia

14.40 Healthy living and 'bio-façades'

Anuradha Sabherwal, Senior associate and project leader, Stantec, UK

Alistair Law, Facade engineer, Arup, UK

15.00 Panel discussion

15.30 COFFEE, EXHIBITION AND POSTER GALLERY

**Session 25****Visioning environmentally sustainable healthcare****Chair:** Liz Paslawsky, Executive advisor, SALUS Global Knowledge Exchange, UK/Australia**16.00 Leadership from above and below – panel discussion**

Human and environmental health are profoundly affected by the way we design, plan, construct and operate our buildings and activities. Leaders in healthcare should consider the environmental determinants of health in every aspect of their operations, setting out a vision for the regenerative design of healthcare services and environments that: nurture instead of harm; replenish resources rather than consume them; enhance biodiversity; promote habitat restoration; and mitigate climate change. By incorporating the triple bottom line of economic, social and environmental impacts, healthcare leaders can empower their staff, patients, visitors and local communities to be activists for the environment and, at the same time, enhance their own health, wellbeing and quality of life.

Panellists:

Sumita Singha,
Non-executive director,
Moorfields Eye Hospital
NHS FT, UK

Tricia Down, Head of health and
capital planning, PFI project director,
Health and Capital Planning, North
Bristol NHS Trust, UK

Jenny Isherwood,
National Medical Director's
Clinical Fellow, Royal College
of Physicians, UK

Stream 7 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and presentation of the European Healthcare Design Awards 2017.

Stream 8 begins at 09.00 with a private working group meeting for Clinicians for Design.
From 14.00, the stream is open to participation from all registered congress delegates.



Session 26

Clinicians for Design working group (by invitation/application only)

Chair: Dr Diana Anderson, Dochitect, Clinicians for Design and Human Experience Lab, Perkins+Will, Canada/Intl

09.00 Clinicians for Design: leading change to radically enhance the quality of healthcare

Eve Edelstein, Director,
Human Experience Lab,
Perkins+Will, USA/Intl

Dr Diana Anderson, Dochitect,
Human Experience Lab,
Perkins+Will, Canada/Intl

Dr Neil A Halpern MD, Chief,
Critical Care Medicine Service
– Anesthesiology and Critical
Care Medicine, Memorial Sloan
Kettering Cancer Center, USA

10.30 COFFEE, EXHIBITION AND POSTER GALLERY

11.00 Clinicians for Design Working Group

Clinicians for Design (CfD) is a new emerging international network with a vision to inspire and accelerate the design of environments and systems that enrich the healthcare interface. Its mission is to build and engage an international working group of clinical expertise, to guide the direction of health design, through leadership within research, education, and policy. The CfD group distinguishes itself as the only group to bring together experts in clinical care, research, education, health delivery and policy. Its distinctive mission provides a global platform for informing the design of health delivery, technologies, systems and policies to enhance patient care. To facilitate the inaugural meeting, Clinicians for Design will be hosting an invitation-only morning workshop. The afternoon sessions, which will feature a series of expert presentations and panel discussions, will be open to all registered congress delegates.

12.30 LUNCH, EXHIBITION AND POSTER GALLERY

Supported by:



Session 27

The Future Hospital Programme

Chair: Eve Edelstein, Director, Clinicians for Design and Human Experience Lab, Perkins+Will, USA/Intl

14.00 Collaborative working and leadership improve outcomes for frail older patients

Zuzanna Stanislawna Sawicka, Consultant
in elderly medicine, Pinderfields Hospital,
Mid Yorkshire NHS Hospitals Trust, UK

Mark Temple, Future hospitals officer,
Future Hospitals Programme, Royal College
of Physicians, UK

14.20 Towards a 'future hospital': facilitating new models of care through a collaborative built environment

Chris Thornton, Healthcare lead, ADP Architecture, UK

Dr Roger Duckitt, Lead, Clinical Acute Medical Unit, Western Sussex Hospitals NHS Trust, UK

14.40 Novel virtual clinic to enable safe hospital discharge and reduce outpatient appointments

Dr Jennifer Kerks, Respiratory SpR, City Hospital, Sandwell and West Birmingham NHS Trust, UK

15.00 Panel discussion

15.30 COFFEE, EXHIBITION AND POSTER GALLERY



Session 28

Universal design and quality improvement

Chair: Dr Neil Halpern, Chief, Critical Care Medicine Service – Anesthesiology and Critical Care Medicine, Memorial Sloan Kettering Cancer Center, USA

16.00 Universal design: homes and healthcare buildings for an ageing population

Dr Diana Anderson MD, Doctitect, Human Experience Lab, Perkins+Will, Canada/Intl

Thomas Grey, Research fellow, Trinity Haus, Trinity College, Ireland

Prof Desmond O'Neill MD, Consultant physician in geriatric and stroke medicine, and professor in medical gerontology, Tallaght Hospital and Trinity College Dublin, Trinity Centre for Health Sciences, Tallaght Hospital, Ireland

Neil Murphy, Senior built environment advisor, Centre for Excellence in Universal Design, National Disability Authority, Ireland

16.20 How the clinicians' role in the briefing process for planning buildings for health can be optimised to obtain maximum value from their position

Dr Emma Stockton, Consultant anaesthetist, Great Ormond Street Hospital, UK

Jennifer Whinnett, Lecturer, London South Bank University, UK

Elizabeth Whelan, Senior lecturer, University of Greenwich, UK

16.40 Panel discussion

Stream 8 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre (17.00–18.00) for the day's closing plenary and presentation of the European Healthcare Design Awards 2017.



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P01 Can overhead hoisting technology ensure effectiveness and quality in care?

Anders Haugaard (Denmark)

P02 Using a systems approach to designing a safer and more ergonomic operating room

Anjali Joseph; Kenneth Catchpole; David Allison; (USA)

P03 CICU patient perspectives on healing environment (2006–2014): a qualitative exploratory study

Astrid Maria Debuchy (Argentina)

P04 Architecture for maternity services: how design can take us from depersonalisation of the subject to a supportive environment

Angela Elizabeth Müller; Marta Parra Casado (Spain)

P05 Enhancing the environment of paediatric oncology unit the Malaysian way: review, revive, recommend

Norwina Mohd Nawawi; Chiam Tat Hong; Aliyah Nur Zafirah Sanusi; Ahmad Naufal Md Alwi (Malaysia)

P06 Space quality in hospital architecture: explorative study and typology analysis of European university hospitals

Anna Sillitti (Germany)

P07 How to evaluate healthcare buildings: selection of methods for evaluating hospital architectural quality and usability – a case at St Olav's Hospital in Norway

Aneta Fronczek-Munter; Johan van der Zwart; Geir Karsten Hansen (Norway)

P08 Kaiser Permanente Sports Medicine Clinic: clinical excellence in an unexpected setting

Ken Schwarz; Craig W McInroy (USA); Dale Sinclair (UK)

P09 Daylighting in practice – within surgical environments

David Allison (USA); Edzard Schultze; Eva Henrich (Germany)

P10 A healthcare oasis on the village commons: envisioning a healthcare campus as the social hub of an entire community

David Stavros (Canada)

P11 Design competition transforms the facade of the Bristol Royal Infirmary

Jane Willis; Andy Headdon; Craig Bennett (UK)

P12 The New Clínica Anglo Americana in Lima, Perú

Clara Rius; Ramon Torrents (Spain)

P13 The social invisibility of mental health facilities: understanding social exclusion through artwork

Dr Evangelia Chrysikou; Dr Naheed Mukadam; Ioanna Tsimopoulou; Ava Fatah gen Schieck (UK)

P14 Designing for change in specialist hospital areas

Rory McGrath (Germany)

P15 Emerging models of cancer care: implications for facility design

Bitu A Kash; Molly McKahan; Sarah Mack; Upali Nanda (USA)

P16 Architecture of pharmacies: co-designing spaces that promote engagement with community pharmacy alcohol services

Dr Ranjita Dhital; Prof Colin Drummond; Rama Gheerawo; Prof Glenn Robert (UK)

P17 Design quality in healthcare environments: how architecture and psychology can meet

Elena Bellini; Daniele Mugnaini; Michele Boschetto (Italy)

P18 A tale of three communities: the value of engagement in mental healthcare environments

Barbara Miszkiel (Canada); Jonathan Wilson (UK)

P19 Neighbourhood health centre – a meeting and exchanges place for health

Gwladys Also; Mayumi Iitsuka (France)

P20 Re-imagining the hospital as community hub: can a hospital act like a community centre?

Burkhard Musselmann (UK); Michael Moxam (Canada); Velimira Drummer; Anita McConnell (UK)

P21 Evaluation of change: design options of patient room configuration in a hospital medical unit

Nirit Putievsky Pilosf; Prof Yehuda E Kalay; Prof Jacob Yahav MD (Israel)

P22 Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems

Martjan den Hoed; Roelof Gortemaker (Netherlands)

P23 The impact of aged people and dementia-friendly environments in users' socio-economic inclusiveness

Davide Landi (UK)

P24 Support system: empowering people with osteoarthritis

Ela Neagu; Elizabeth Raby; Dr Chris McGinley (UK)

P25 The relation of visual impairment to the risk of falling among older adults

Widya Aulia Ramadhani (USA)

P26 Shifting elderly care: case studies of multi-generational communities in Europe and the USA

Tatiana Epimakhova (USA/Russia)

P27 Health Springs: an innovative wellness and fall-prevention approach for Singaporean elderly in high-rise housing

Jinting Lee (USA); Susan Rodiek (USA); Chek Hooi Wong (Singapore); Xuemei Zhu (USA)

P28 Patient falls in an elderly care/hospice setting

Hugh Sexton; Eoin O Morain (UK)

P29 New schools, new learning – school as prevention and health promoter

Susanne Glade; Christoph Ostermeyer; Anna Sillitti (Germany)

P30 Designing wellbeing into the built environment: 'Our Future Foyle'

Elizabeth Raby; Ralf Alwani; Jonathan West; Jo-Anne Bichard (UK)

P31 Acute psychiatric facilities: therapeutic spaces or stigmatising places?

Gabrielle Jenkin (New Zealand); Dr Evangelia Chrysikou (UK); Debbie Peterson (New Zealand); Prof Sunny Collings (New Zealand)

P32 Designing with care: hospice design since 1980

Mura Mullan; Julie Trueman; Peter Holgate (UK)

P33 The design concept of common places for healthcare centres: a review from Turkey

Elif Baker; Bilge Sayil Onaran (Turkey)

P34 The role of contemporary artworks in GP waiting rooms

Jayne Lloyd (UK)

P35 Please remove shoes: shoe removal practice, transitional space, and human health

Widya Aulia Ramadhani;
Kathryn H Anthony (USA)

P36 Breaking out of the Snow cave – the significance of colour in healthcare environments

Stine Louring Nielsen; Michael Mullins
(Denmark)

P37 Waiting well: start as you mean to go on

Agata Zamasz; Cressida Toon;
Gary Toon (UK)

P38 Healthcare design that empowers patients to make a return to independent living through environments that foster community support and reinforce identity and purpose

David Stavros (Canada)

P39 Making art for people with the most challenging forms of dementia, at the Continuing Care Unit, Lambourn Grove

Louisa Williams; Martin Jones (UK)

P40 Project of the largest hospital in the eastern part of Russia

Igor Gonchar; Maiia Kuminova;
Mikhail Fomin; Egor Korchagin (Russia)

P41 Towards new master plan 2.0

Jean-François Medelli (France)

P42 The use of art to support wayfinding across complex health buildings

Jane Willis; Colette Jeffrey;
Abigail Pride (UK)

P43 Links between art pictures in classroom and repetitive behaviours in children with autism: an observational study

Shireen Kanakri (USA)

P44 Creating compassionate environments utilising integrated and bespoke quality influencing and learning tools to support health and wellbeing of people affected by cancer

Jill Weeden; Fred Currell (UK)

P45 I can hear but I do not understand: impaired recognition of environmental sounds in patients with dementia

Dr Ing Birgit Dietz; Janine Diehl-Schmid;
Johannes Mayer (Germany)

P46 Making frailty a priority: experiences of an innovative GP-led multidisciplinary approach to frailty within secondary care

Dr Juan Corkill; Dr Cat Roberts;
Dr Ben Atkins (UK)

P47 Towards a vision of the 'hospital of tomorrow'

Didier Bourdon (France)

P48 How effective inter-professional collaboration between designers, clinicians and managers can improve the design of healthcare facilities

Jane Carthey (Australia)

P49 A critical component in sustainable global health: mental health

Philip Patrick Sun (USA)

P50 Design requirements of high-level isolation unit – development requirements framework

Philip D Astley; Anne W Symons; Timothy
D McHugh; Sir Michael Jacobs (UK)

Healthcare Design (Over 25,000 sqm)

- A01** Brunel Building, Southmead Hospital, UK
 - A02** Brigham and Women's Hospital Building for Transformative Medicine, USA
 - A03** Markham Stouffville Hospital Redevelopment, Canada
 - A04** The New Stamford Hospital, USA
-

Healthcare Design (Under 25,000 sqm)

- A05** Eastwood Health & Care Centre, UK
 - A06** The Bright Alliance, Prince of Wales Hospital, Sydney, Australia
 - A07** New Cancer Centre at Guy's Hospital, UK
 - A08** Biripi Clinic, Purfleet, Australia
-

NHS Healthcare Design

- A09** North West Cancer Centre, UK
 - A10** Ulster Hospital Inpatient Ward Block, UK
 - A11** New Cancer Centre at Guy's Hospital, UK
-

Mental Health Design

- A12** Woodland View, Ayrshire Central Hospital, Irvine, UK
 - A13** Clinic Psychiatry Radboud university medical centre, Netherlands
 - A14** Mitford, Adult Autism Unit, UK
-

Design for Conversion or Infill

- A15** Hospital of the Goethe University Frankfurt am Main, Germany
- A16** Biripi Clinic, Purfleet, Australia

Design for Health and Wellness

- A17** Vårdcentralen Nötkärnan, Bergsjön, Sweden
- A18** Mitford, Adult Autism Unit, UK
- A19** Maggie's at the Robert Parfett Building, UK
-

Interior Design and Arts

- A20** Guy's Cancer Centre, UK
- A21** Children's Emergency Department (A&E), Evelina London Children's Hospital, UK
- A22** The Cove Macmillan Support Centre, UK
- A23** Forum Health Centre, UK
-

Future Healthcare Design

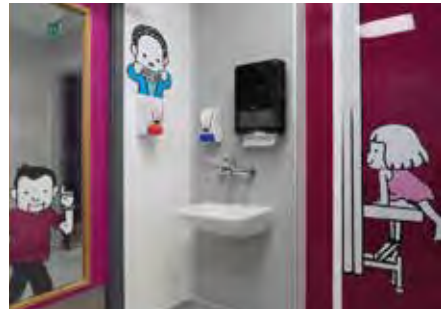
- A24** Nya Karolinska Solna, Sweden
- A25** Haunersches Children's Hospital at Grosshadern Campus, Germany
- A26** Phillips House Redevelopment, Canada
-

Design Innovation for Quality Improvement

- A27** Reactivating Hospital, Netherlands
- A28** Ryno, UK
- A29** Pillo. Personal Home Health Robot and its Connected App, USA
-

Design Research

- A30** Normalcy in healthcare design: an extension of the natural and built environment
- A31** Innovative design technology to improve the safety of hospitals
- A32** Usability briefing for hospital architecture – exploring user needs and experiences to improve complex buildings
- A33** Emergency talks – designing emergency departments to maximise staff communication



Integrated art & design for healthcare environments

Children's Emergency, Evelina London

Awards Shortlist, European Healthcare Design 2017

Presenting project at European Healthcare Design (Monday 12th June)

WELCOME DRINKS RECEPTION

maggie's

Charity address: Tom Marshall,
head of partnerships, Maggie's
Official Charity Partner of European
Healthcare Design 2017

The charity address from Maggie's will be preceded and followed by a classical musical performance by the Royal Academy of Music.

Since its foundation in 1822, the Royal Academy of Music has made an inestimable impact on the musical landscape, both in the UK and abroad. Indeed, it has permeated the music profession at all levels, with Academy alumni including classical giants Sir Simon Rattle and Sir Harrison Birtwistle, along with pop stars Elton John and Annie Lennox.

Every year, talented young musicians from more than 50 countries come to the UK to study at the Academy, attracted as they are by world-renowned teaching and a rich culture that broadens their musical horizons.

The European Healthcare Design 2017 exhibition will also be open during the Welcome Drinks Reception.

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Venue: Osler and Long Rooms

Date: Monday 12 June

Time: 18.00 - 20.00



GARDEN PARTY

Venue: Medicinal Gardens

Date: Tuesday 13 June

Time: 18.30 - 22.00

Held outside in the informal surroundings of the medicinal gardens of the Royal College of Physicians, the European Healthcare Design 2017 Congress Garden Party will immediately follow the end of the congress and the European Healthcare Design Awards ceremony.

Celebrate with the winners in the Royal College's beautiful medicinal gardens.

Opened in 1965, the gardens were extensively replanted in 2005-06, thanks to a generous grant from the Wolfson Foundation, and now feature more than 1300 plants.

Throughout the evening, a jazz quartet comprising students of the Royal Academy of Music will deliver a captivating musical performance.

Featuring spectacular garden lighting, lanterns and candles, the Garden Party will offer a great opportunity at the close of the congress to network and socialise, and enjoy the British summer! To reflect the surroundings, and as a relaxing end to an intense two days of congress activity, the dress code will be smart casual, with delegates treated to a barbeque buffet dinner.



Participants in the European Healthcare Design 2017 Congress will get the opportunity to join three unique study tours featuring some of the UK's latest benchmark healthcare projects and architectural landmarks. Places on each tour are now fully booked.

Study tour 1: London

Departure point: Melia White House Hotel

Date: 14 June, 2017

Time: 09.00–16.30

Maggie's West London

Built in 2008, the bright orange building of Maggie's West London shields visitors from the bustling city streets and hospital that surround it, offering a calm oasis and setting for Maggie's evidence-based programme of support. Designed by Rogers Stirk Harbour + Partners, Maggie's West London was inspired by Sir Richard Rogers's concept of a heart nestled in the protective wrap of a building's four walls. Visitors are welcomed into an uplifting interior with cosy rooms, bright open spaces and transitional walls, which provide a flexible space to host everything from intimate chats to lively exercise classes.



Lunch at the Shard

Lunch will be provided in a private dining area at Aqua Shard on level 31 of one of the tallest buildings in Europe, the iconic Shard, designed by Renzo Piano.

New Cancer Centre at Guy's Hospital

The new Cancer Centre at Guy's Hospital, designed by Rogers Stirk Harbour + Partners and Stantec, is a hub for southeast London. The centre provides specialist cancer services, training, development and research, which will help improve both cancer treatments and outcomes for patients. The centre is divided into 'zones' or 'villages', with most of the related treatment facilities grouped together in one place. Embedded artwork, use of light and outdoor spaces, with balconies in each village, play a key part in creating a positive experience for patients, staff and visitors.



Study tour 2: London

Departure point: Melia White House Hotel

Date: 14 June, 2017

Time: 08.30–17.30

St Bartholomew's Hospital

The oldest hospital in Europe, St Bartholomew's Hospital was founded in 1123 by Rahere, a favourite courtier of King Henry I. Today, Barts Hospital is a specialist cancer and cardiac centre, providing a contemporary design sympathetic to the existing Georgian architecture in the historic part of the City of London. As part of a joint PFI redevelopment with the Royal London Hospital, St Bartholomew's was designed by HOK, after being appointed by Skanska. The project was a European Healthcare Design 2016 award winner.

New QEII Hospital, Welwyn Garden City

The New QEII Hospital is a European Healthcare Design 2016 award winner. It is among the first of a new generation of NHS local hospitals integrating primary, acute and social care services to serve the local population. It replaces the 1950s QEII Hospital – one of the first purpose-built NHS district hospitals – which had reached the end of its useful life. Patient and public engagement played significant roles in the work to deliver both this £30m facility and the £150m investment to concentrate specialist acute services at the 'sister' site, the Lister Hospital, in Stevenage. Procured under an NHS LIFT Public Private Partnership, the contractual arrangements enable services to adapt as health service provision changes.





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Laing O'Rourke Construction North 2015
IHEEM 2015
Building Better Healthcare 2015
European Healthcare Design
2016



Study tour 3: Liverpool

Departure point: Melia White House Hotel

Date: 14 June, 2017

Time: 06.30–20.00



Alder Hey in the Park

Alder Hey Children's Hospital in Liverpool was a multiple award winner at European Healthcare Design 2016. Opened in October 2015, the facility covers 65,000 sqm, contains 270 beds and cost £200m. The design, by BDP, reflects the specifications of the children who helped steer the design from its inception – in particular, the desire to maintain contact with nature while in the hospital. Featuring green roofs and gardens, the Park wraps itself over and around the building. With an emphasis on high-quality personalised spaces for patients, the design provides 75-per-cent single bedrooms and impressive views of the surrounding parkland. The hospital's large technical core has 16 theatres, a 48-bed intensive care unit and a large imaging department.

Royal Liverpool University Hospital

The new Royal Liverpool University Hospital is a 95,000 sqm acute hospital designed by NBBJ and HKS. Due for completion this autumn, it's located on the existing hospital campus near Liverpool city centre. Housing 650 single beds, including 40 critical-care and 81 emergency assessment beds, it will be Liverpool's main emergency centre capable of dealing with major trauma. The vision of the client NHS trust is to "develop a world-class hospital in an attractive and accessible site that is an integral part of the city". The resulting hospital will be a contemporary landmark, which will reconnect and engage with the city while providing a healing environment that will enhance the patient, visitor and staff experience.



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The European Healthcare Design Awards 2017

Lead Awards Sponsor



The European Healthcare Design Awards 2017 celebrate and recognise professional and research excellence in the design of healthcare environments both in Europe and around the world.

The awards aim to have a significant influence on the creation of environments that promote health and wellbeing, embed quality improvement, and support the delivery of treatment and care in an accessible, economic and equitable way.

Organised by Architects for Health and SALUS Global Knowledge Exchange, the awards comprise ten categories across primary, community, secondary and tertiary levels of international healthcare provision and delivery. They will be presented at an illustrious ceremony during the final session of the 3rd European Healthcare Design 2017 Congress & Exhibition on 13 June. It is hoped they will contribute towards the development of knowledge and standards in the design of healthcare environments around the world.

Recipients of the awards will be multidisciplinary project teams demonstrating outstanding vision, leadership and knowledge in the design, development and implementation of projects that have positively transformed the delivery and experience of healthcare for the patients and community they serve.

All award submissions are also given the opportunity to be featured on a fully searchable map of healthcare projects on the SALUS Global Knowledge Exchange (www.salus.global).



Evaluation committee

The awards evaluation committee features international researchers, practitioners and policy advisors, who bring specialist multidisciplinary expertise to the specific categories they have been invited to judge.

The shortlist and winner of each award are determined by a category chair, supported by two other judges with proven expertise in their field. This robust evaluation methodology ensures a balanced and transparent decision-making process.

Healthcare Design (Over 25,000 sqm)

An outstanding healthcare project in a secondary or tertiary care setting that demonstrates high levels of sustainability and urban integration, creates an effective clinical environment, promotes service improvement, and provides a supportive environment for staff, patients and their families.



Lead judge:

Diana Anderson, Human Experience Lab, Perkins+Will, Canada/Intl

Judging panel:

Craig Dixon, K D Health, UK
Kate Copeland, Australian Health Design Council; Metro North Hospital and Health Service, Australia

Shortlist

Brigham and Women's Hospital Building for Transformative Medicine

Commissioned by Brigham and Women's Hospital
Designed by NBBJ

Brunel Building, Southmead Hospital

Commissioned by North Bristol NHS Trust
Designed by BDP (*pic: right*)

Markham Stouffville Hospital Redevelopment

Commissioned by Markham Stouffville Hospital and Infrastructure Ontario
Designed by B+H Architects in association with Perkins+Will

The New Stamford Hospital

Commissioned by Stamford Health
Designed by EYP Health (*pic: below left*)



Longlist

Hospital of the Goethe University
Frankfurt am Main
Commissioned by The State of Hesse
Designed by Nickl & Partner Architekten AG

Children's Fund
Designed by Sheppard Robson International + John Cooper Architecture



Burwood Hospital Redevelopment
Commissioned by Proj-X Solutions
Designed by Jasmax, Klein, Sheppard & Rout
Ward of the Future
Commissioned by Tan Tock Seng Hospital
Designed by Context Architects

Regional Clinical Hospital in Krasnoyarsk, Russia
Commissioned by Regional Clinical Hospital in Krasnoyarsk, Russia
Designed by JSC WERFAU

University of Minnesota Health Clinics and Surgery Center
Commissioned by University of Minnesota Health
Designed by CannonDesign

Ulster Hospital Inpatient Ward Block
Commissioned by Strategic and Capital Development, South Eastern Health and Social Care Trust
Designed by Avanti Architects

Nelson Mandela Children's Hospital
Commissioned by Nelson Mandela

Healthcare Design (Under 25,000 sqm)

An outstanding healthcare project in a community or primary care setting that demonstrates high levels of sustainability and urban integration, transforming the quality of care services in an accessible location, and supporting the integrated needs of staff, patients and the community.



Lead judge:

Jonathan Erskine,
European Health
Property Network, UK

Judging panel:

Ganesh Suntharalingam, London North
West Healthcare NHS Trust, UK
Charlotte Ruben, White Arkitekten, Sweden

Shortlist

New Cancer Centre at Guy's Hospital

Commissioned by Guy's and
St Thomas' NHS Foundation Trust
Designed by Rogers Stirk Harbour
+ Partners and Stantec Architecture

Eastwood Health & Care Centre

Commissioned by Greater Glasgow & Clyde
NHS, and East Renfrewshire Council
Designed by Hoskins Architects

Biripi Clinic, Purfleet *(pic: right)*

Commissioned by Biripi Aboriginal
Corporation Medical Centre
Designed by Kaunitz Yeung Architecture

The Bright Alliance, Prince of Wales Hospital, Sydney

Commissioned by NSW Health
Infrastructure
Designed by HDR



Longlist

Arvo Building

Commissioned by SYK Oy
Designed by Arkkitehtitoimisto Helamaa
& Heiskanen Oy

Shanghai Jiahui Yangpu Clinic

Commissioned by Jiahui Health
Designed by Roberts Spaces Architecture
Interiors Engineering

Bupa Medical Centre – GT Land

Commissioned by Bupa China
Designed by Roberts Spaces Architecture
Interiors Engineering

North West Cancer Centre

Commissioned by Western Health and Social
Care Trust Northern Ireland
Designed by O'Connell Mahon Architects

St Jude Research Hospital Kay Research and
Care Center – Inpatient Floors 3, 4, and 5

Commissioned by St Jude Children's
Research Hospital

Designed by EYP / Stanley Beaman & Sears

Whitman-Walker Health

Commissioned by Whitman-Walker Health
Designed by Perkins+Will

Sahlgrenska University Hospital Centre for Imaging & Intervention

Commissioned by Region Västra Götaland
Designed by WSP

Memorial Sloan Kettering – Josie Robertson Surgery Center

Commissioned by Memorial Sloan Kettering
Cancer Center
Designed by Perkins Eastman

Forum Health Centre

Commissioned by Forum Health Centre
Designed by IDP

NHS Healthcare Design

An outstanding healthcare project in any setting for the UK's National Health Service (NHS) that demonstrates new design thinking to sustainably transform the quality of care services in a compassionate and humanistic environment for staff, patients and families.



Lead judge:

Beatrice Frankel, Mersey
Care NHS Foundation
Trust, UK

Judging panel:

Karin Imoberdorf,
Lead Consultants, Switzerland
John Jenner, Consultant, UK

Shortlist

North West Cancer Centre

Commissioned by Western Health and
Social Care Trust Northern Ireland
Designed by O'Connell Mahon Architects

New Cancer Centre at Guy's Hospital

Commissioned by Guy's and St Thomas'
NHS Foundation Trust (*pic: below right*)
Designed by Rogers Stirk Harbour +
Partners and Stantec Architecture

Ulster Hospital Inpatient Ward Block

Commissioned by Strategic
and Capital Development,
South Eastern Health and
Social Care Trust
Designed by Avanti Architects
in association with Kennedy
FitzGerald Architects
(*pic: top right*)



Longlist

Brunel Building, Southmead Hospital
Commissioned by North Bristol NHS Trust
Designed by BDP

Hanbury Building, clinical decant for the
3Ts Redevelopment of the Royal Sussex
County Hospital
Commissioned by Brighton and Sussex
University Hospitals NHS Trust
Designed by Portakabin

Courtyard Building, clinical decant for the
3Ts Redevelopment of the Royal Sussex
County Hospital
Commissioned by Brighton and Sussex
University Hospitals NHS Trust
Designed by Portakabin

Ancora House
Commissioned by Cheshire & Wirral
Partnership NHS Foundation Trust
Designed by Gilling Dod Architects

Forum Health Centre
Commissioned by Forum Health Centre
Designed by IDP

Eastwood Health
& Care Centre
Commissioned by
Greater Glasgow
& Clyde NHS, and
East Renfrewshire
Council
Designed
by Hoskins
Architects



Mental Health Design

A mental health project that, through innovative design thinking, achieves a reconciliation between the needs of the patient/resident for a humanistic environment that supports ongoing therapy, care and recovery, and the requirement for appropriate levels of safety, security and supervision.



Lead judge:

John Cole, Honorary Professor, Queen's University Belfast, UK

Judging panel:

Alice Liang, Montgomery Sisam Architects, Canada

Justin De Syllas, Avanti Architects, UK

Shortlist

Clinic Psychiatry Radboud university medical centre

Commissioned by Radboud university medical centre
Designed by EGM architects and Suzanne Holtz Studio (*pic: right*)

Woodland View, Ayrshire Central Hospital, Irvine

Commissioned by NHS Ayrshire and Arran
Designed by IBI Group (*pic: below*)

Mitford, Adult Autism Unit

Commissioned by Northumberland, Tyne and Wear NHS Foundation Trust
Designed by Medical Architecture



Longlist

Ancora House
Commissioned by Cheshire & Wirral Partnership NHS Foundation Trust
Designed by Gilling Dod Architects

Atherleigh Park Hospital
Commissioned by 5 Boroughs Partnership NHS Foundation Trust
Designed by AFL Architects

Whitman-Walker Health
Commissioned by Whitman-Walker Health
Designed by Perkins+Will



Design for Conversion and Infill

An outstanding healthcare project that is small in scale but has a high transformational impact on resolving complex and difficult service design challenges in a location with significant constraints.



Lead judge:

Jim Chapman, Emeritus
Professor, Manchester
School of Architecture,
UK

Judging panel:

Jane McElroy, NBBJ, UK
Chris Shaw, Medical Architecture, UK

Shortlist

Hospital of the Goethe University Frankfurt am Main

Commissioned by The State of Hesse
Designed by Nickl & Partner
Architekten AG (*pic: top right*)

Biripi Clinic, Purfleet

Commissioned by Biripi
Aboriginal Corporation
Medical Centre
Designed by Kaunitz
Yeung Architecture
(*pic: below right*)



Longlist

Bristol Royal Infirmary Facade Redesign
Commissioned by University Hospitals
Bristol NHS Foundation Trust
Designed by Nieto Sobejano Architectos

Hanbury Building, clinical decant for the
3Ts Redevelopment of the Royal Sussex
County Hospital
Commissioned by Brighton and Sussex
University Hospitals NHS Trust
Designed by Portakabin

Courtyard Building, clinical decant for the
3Ts Redevelopment of the Royal Sussex
County Hospital
Commissioned by Brighton and Sussex
University Hospitals NHS Trust
Designed by Portakabin

Forum Health Centre
Commissioned by Forum Health Centre
Designed by IDP

Paediatric Ward Remodelling + Extension
to create Teenage Oncology Unit and
Dedicated PAU
Commissioned by Frimley Health NHS
Foundation Trust
Designed by ADP Architecture



Design for Health and Wellness

An inspirational project that encompasses services outside of traditional healthcare settings and, through an alignment of the care philosophy with the design of the environment, helps to promote positive behaviours towards healthy living and wellness.



Lead judge:

Liz Paslawsky, Consultant advisor, SALUS Global Knowledge Exchange, UK/Australia

Judging panel:

Helina Kotilainen, National Institute for Health and Welfare, Finland

Jonathan Wilson, Principal and sector lead, healthcare, Stantec, UK

Shortlist

Mitford, Adult Autism Unit

Commissioned by Northumberland, Tyne and Wear NHS Foundation Trust
Designed by Medical Architecture

Maggie's at the Robert Parfett Building

Commissioned by Maggie's
Designed by Foster + Partners *(pic: top right)*

Vårdcentralen Nötkärnan, Bergsjön

Commissioned by Bergsjön Nötkärnan Vårdcentral och BVC
Designed by Wingårdh Arkitektkontor
(pic: below right)



Longlist

Bournville Care Home
Commissioned by Hamberley
Designed by KMK Consulting

Biripi Clinic, Purfleet
Commissioned by Biripi Aboriginal Corporation Medical Centre
Designed by Kaunitz Yeung Architecture

Forum Health Centre
Commissioned by Forum Health Centre
Designed by IDP

Shanghai Jiahui Yangpu Clinic
Commissioned by Jiahui Health
Designed by Roberts Spaces Architecture
Interiors Engineering

Bupa Medical Centre – GT Land
Commissioned by Bupa China
Designed by Roberts Spaces Architecture
Interiors Engineering

Whitman-Walker Health
Commissioned by Whitman-Walker Health
Designed by Perkins + Will



Interior Design and Arts

An inspirational project that demonstrates exceptional skill in creating a compassionate healthcare environment that reflects and communicates the values of the healthcare provider through the integrated application of interior design with the visual arts.

Judging panel:

Jacqui Bunce, East and North
Hertfordshire Clinical Commissioning
Group, UK

Pam Bate,
Hopkins Architects, UK



Shortlist

Forum Health Centre

Designed by IDP

Children's Emergency Department (A&E), Evelina London Children's Hospital

Commissioned by Essentia at Guy's
and St Thomas' NHS Foundation Trust
Designed by ADP Architecture
Designed by Art in Site

The Cove Macmillan Support Centre

Commissioned by Royal Cornwall Hospital NHS Trust

and Macmillan Cancer Support
(pics: top right and below left)

Produced by Willis Newson; Artworks by
Kurt Jackson, Scott Woyka and Chelsea Holter
Architecture and interior design by ADP Architects

New Cancer Centre at Guy's Hospital

Commissioned by Guy's and St Thomas' NHS
Foundation Trust; Curated by Futurecity
Designed by Rogers Stirk Harbour + Partners
and Stantec Architecture

Longlist

Hospital of the Goethe University Frankfurt am Main
Commissioned by the State of Hesse
Designed by Nickl & Partner Architekten AG

Autism-friendly sensory waiting room
in the Emergency Department of
Careggi Hospital (Florence)
Commissioned by AOUC –
Careggi University Hospital
Designed by DU IT

New Intensive Care Unit, The
London Clinic
Commissioned by The London Clinic
Designed by Murphy Philipps Architects

Tameside Macmillan Unit
Commissioned by Tameside General Hospital
Designed by Willis Newson

Derwent Dementia Ward, Kingston Hospital
Commissioned by Kingston Hospital NHS FT
Designed by Hunters

Hillingdon Hospital New A&E Department
Commissioned by Hillingdon Hospital Estates
Department
Designed by GBS Health+

Artist-led design solution creates inclusive hospital
sanctuary space
Commissioned by University Hospitals Bristol NHS
Foundation Trust
Designed by Willis Newson

Art Scheme for Lambourn Grove, Continuing
Healthcare Unit
Commissioned by Hertfordshire Partnership
University NHS Foundation Trust
Designed by Art in Site

Bedrooms and Ward Bays, Sheffield
Children's Hospital
Commissioned by Artfelt
Designed by Studio Myerscough



Future Healthcare Design

Supported by   

A future healthcare project that can demonstrate the potential for outstanding outcomes in masterplanning, placemaking, wellness and sustainability, in alignment with the strategic requirements of the healthcare provider to transform their services within the wider community, regional or national health system.



Lead judge:

Birger Stamsø, South Eastern Norway Regional Health Authority, Norway

Judging panel:

Tricia Down, Southmead Hospital, UK
Warren Kerr, University of Western Australia, Australia

Shortlist

Nya Karolinska Solna

Commissioned by Stockholm County Council
Designed by WhiteTengbom Team AB
Built by Skanska (*pic: below*)

Haunersches Children's Hospital at Grosshadern Campus

Commissioned by Staatliches Bauamt München
Designed by Nickl & Partner Architekten AG (*pic: left*)

Phillips House Redevelopment

Commissioned by North York General Hospital
Designed by Montgomery Sisam Architects

Longlist

Belong: Newcastle-under-Lyme
Commissioned by Belong / Prime
Designed by Pozzoni Architecture

HealthCity Novena Master Plan 2030
Commissioned by Tan Tock Seng Hospital
Designed by Surbana International Consultants and Broadway Malayan

Abdali Clemenceau Hospital
Commissioned by Clemenceau Medicine International
Designed by AECOM

Chase Farm Hospital, London
Commissioned by Royal Free London NHS FT
Designed by IBI Group

KCH Healthcare LL.C. – King's College Hospital Dubai
Commissioned by KCH Healthcare LL.C.
Designed by Perkins+Will

Circle Birmingham Hospital
Commissioned by Circle Health
Designed by Simons Group

PPI Cancer Centre, Northumbria
Commissioned by Proton Partners International
Designed by JDDK

Turkmenistan Doctors' Training Center, Lukmancylyk Campus
Commissioned by The GAP Insaat Yatirim Ve disTicaret Group
Designed by Perkins+Will

Shaare Zedek Medical Center Cancer Center
Commissioned by Shaare Zedek Medical Center
Designed by Farrow Partners

Midland Metropolitan Hospital
Commissioned by Sandwell and West Birmingham Hospitals NHS Trust
Developed by The Hospital Company, (Carillion Joint Venture)
Designed by HKS, Edward Williams Architects, Sonnemann Toon Architects

Shaare Zedek Medical Center Master Plan
Commissioned by Shaare Zedek Medical Center
Designed by Farrow Partners

Centre for Addiction and Mental Health Phase 1C
Commissioned by Centre for Addiction and Mental Health
Designed by Montgomery Sisam Architects / KPMB Architects



Design Research

Supported by



An independently assessed, completed research study that can demonstrate current relevance and practical application in the design of healthcare services and environments. The research should show application of a rigorous methodology, and how it is supporting innovation and inspiring future studies.



Lead judge:

Ruzica Bozovic
Stamenovic, National
University of Singapore,
Singapore

Judging panel:

Linda Jones, Massey University,
New Zealand

Shortlist

Normalcy in healthcare design: an extension of the natural and built environment

Dr Omniya El Baghdadi, Project co-ordinator, Queensland University of Technology, Australia

Professor Jenny Ziviani, Children's Allied Health Research, Queensland Health, Australia

Katharina Nieberler-Walker, Principal and head of landscape architecture, Conrad Gargett, Australia

Dr Angela Reeve, Visiting researcher, Queensland University of Technology, Australia

Associate Professor Cheryl Desha, School of Engineering / Cities Research Institute, Griffith University, Australia

Innovative design technology to improve the safety of hospitals

Dr Aoife L E Hunt, Consultant, AECOM, UK

Usability briefing for hospital architecture – exploring user needs and experiences to improve complex buildings

Aneta Fronczek-Munter, Post-doctoral researcher in smart hospital architecture, Architect PhD, MSc.Arch. Eng., NTNU Norwegian University of Science and Technology, Faculty of Architecture and Fine Art, Trondheim, Norway

Emergency talks – designing emergency departments to maximise staff communication

Dr Lucio Naccarella, Centre for Health Policy, Melbourne School of Population and Global Health, The University of Melbourne, Australia

A/Prof Bernice Redley, Centre for Quality and Patient Safety Research – Monash Health Partnership, School of Nursing and Midwifery, Faculty of Health, Deakin University, Australia

Michaela Sheahan, HASSELL, Australia
(pic: top right)



Design Innovation for Quality and Improvement

A technological or product innovation that has had a transformational impact on the design of healthcare services and/or the patient experience, improving the quality, efficiency and accessibility of care in a specific healthcare setting or across the continuum of primary, community and secondary care.



Lead judge:

Ed Matthews, Helen
Hamlyn Centre, UK

Judging panel:

Christine Chadwick, GE Healthcare, Canada
Steve Wilcox, Design Science, UK

Shortlist

Ryno

Designed by Pineapple Contracts
(pic: top right)

Pillo. Personal Home Health Robot and its Connected App

Developed by Pillo Health
Designed by 415Agency
and Impel Studio

Reactivating Hospital

Designed by de Jong Gortemaker
Algra Architects and Engineers
(pic: below right)



Longlist

Ward of the Future (WoF)
Commissioned by Tan Tock Seng Hospital
Designed by Context Architects

GH Positioning Lock
Designed by Guldmann

HBS Healthcare Building System
Developed by NIBUG New Industrialised
Building Generation
Designed by Mario Corea Arquitectura /
CT Engineers

Acorn Partners
Designed by Nova

Digital Alder Hey
Designed by ustwo
Developed by Alder Hey Children's NHS
Foundation Trust

KwickScreens at Guy's Cancer Centre
Designed by KwickScreen

**Bobby Duffy** (UK)

Managing director
Ipsos MORI, UK

Keynote address: Citizens' views of health services around the world

Bobby will discuss the variation between how people in different countries rate their current healthcare services, and how this relates to their concern about the future of the services. For example, Ipsos data reveals that there are 'worried well' countries, where citizens rate the quality of their current healthcare highly but are very worried about what it will look like in the future.

It seems there is little correlation between the level of concern people feel about their healthcare and actual health indicators, or actual expenditure on health. Bobby will look at what this means for the UK in more detail, exploring exactly what people are concerned about, as well as which aspects of future healthcare systems might be more attractive than others. He will also draw on insights from behavioural research about the extent to which people are keen to take responsibility to improve their own health.

Keynote address: Tackling wasteful spending to improve health system performance: an international perspective

Up to a fifth of health expenditure makes little or no contribution to improving people's health. In some cases, it even results in worse health outcomes.

Wasteful spending occurs, for instance, when patients are harmed in the process of care, receive interventions that are not medically indicated, use brand-name drugs instead of generics, or are unnecessarily treated in a hospital instead of a more suitable lower-level facility. Countries could potentially spend significantly less on healthcare with no impact on health system performance, or on health outcomes.

Agnès' keynote will focus on a recent report by the OECD that systematically reviews strategies put in place by countries to limit ineffective spending and waste. Actions to tackle waste are needed in the delivery of care, in the management of health services, and in the governance of the system. Acknowledging the existence of wasteful spending and collecting more systematic information on its scope are necessary steps.

Tackling waste requires persuading all stakeholders that the best option is the least wasteful one, and developing payment and incentives that reward the delivery of the right care in the right place.



Agnès Couffinhal (France)

Senior economist
OECD

**John Cooper** (UK)

Director
John Cooper Architecture

Addressing London's health and housing crisis by design

One of the principal themes of this conference is the reorganisation of healthcare systems to increase the provision of care at a local level, managing chronic disease and mental illness within primary care settings, and thus reducing the need for disruptive hospital interventions.

But the reorganisation of health systems to achieve these objectives is becoming increasingly difficult to implement. We have fewer doctors, hospital beds and high-grade diagnostic imaging machines than almost every country in Europe. This year's political convulsions – Brexit, Trump, Renzi – with their contempt for 'experts' will make change at a local level ever-more difficult to achieve.

Despite being seen as the capital of the 'metropolitan elite', London has a much poorer health estate than many other UK cities and a higher proportion of trusts deemed to be failing. For four years, consultants have been preparing reorganisation strategies at vast expense, which can still be presented pejoratively as closing hospital beds, centralising tertiary services, increasing funding for primary and community care, and selling off the surplus estate. Whereas 'experts' understand the necessity for such change, the way in which these strategies are being developed and presented is alarmingly clumsy.

London has many priorities but those that top the agenda are how we can address the housing and healthcare crises. This paper is based on seven exemplar projects on seven London hospital sites, which can create model developments and new neighbourhoods. Each will maintain or re-provide secondary and/or tertiary hospital facilities, and develop community healthcare accommodation. Each will also develop a blend of residential accommodation for the elderly, sheltered housing, social housing, and housing for sale. Some will emphasise the need for landscape and parkland, others will achieve high densities, and all of them can serve as tools for developing a wider understanding.

Concrete visions such as these provide physical and comprehensible examples of what the new health estate can achieve, what choices are available, and why it's essential to integrate social care and healthcare. At a local level, debate and argument must be generated and change championed.

From wounded city to healing environment

Rotterdam was seriously wounded by war, while road construction sliced the city up into isolated islands of development. Erasmus MC was one such island, nothing more than a collection of unrelated buildings.

Today, however, the city and medical districts pride themselves on new and meaningful places of all sizes. In 2014, Rotterdam was crowned the best city in Europe. So where will the city and Erasmus MC be in 2018?

Some 450 million tonnes of goods pass through Europe's biggest port every year, on their way to 350 million consumers. The ambition is to achieve excellent trans-shipment in the world's most sustainable port. Similar smart logistics are in evidence at Erasmus MC, which has 13,000 employees and 4500 students, and carries out 530,000 outpatient consultations a year. At the same time, the biggest care project in the country is under development next to the vast hospital complex.

Erasmus MC offers a natural sense of calm, combining hospital processes with new technologies and sustainability. R&D has led to smart architectural answers to complex questions: separate logistics for people and goods; clear orientation by views; greenery and art in public areas; and stress-reducing waiting spaces. Supporting all of this is clear wayfinding via attractive points of vertical circulation.

The city council values Erasmus MC as "a very important place, where internationally renowned museums, green oases, and the medical district create 'space for body and mind'". By enhancing connections between the city and hospital, and creating attractive and easy access to neighbouring parks and museums, positive diversions are provided for patients, staff and students alike.

New connections are also established within the complex. Public zones with retail areas interlock seamlessly with the realms of care, learning and research. Magnificent vistas of a stunning skyline can be enjoyed even from your bed, and stress-reducing daylight and greenery in the radiotherapy and emergency department create a positive atmosphere.



Willemineke Hammer
(Netherlands)

Partner
EGM architects



Liesbeth van Heel
(Netherlands)

Project secretary, Manager
Directorate of Corporate Real
Estate, Erasmus MC



Royal Hospital for Sick Children, Edinburgh

HLM is a creative and responsive organisation with significant experience in the design and procurement of healthcare buildings in the UK and internationally. We recognise the importance of design quality, sustainability, and innovation in the creation of truly therapeutic environments. We have a proven track record and expertise in the design and procurement of all types of buildings within the healthcare sector, from the masterplanning of large hospital sites to the configuration of individual rooms within acute, primary care, and mental health settings.

EDINBURGH's newest healthcare facility is a vast undertaking. The £250M Royal Hospital for Sick Children and Department of Clinical Neurosciences is set to bring the distinct services of the Children and Young People's Hospital (which includes mental health services for children and adolescents) and the Department of Clinical Neurosciences (DCN) into one state-of-the-art building.

The landmark scheme – which was design-led by HLM – is currently being constructed alongside Edinburgh's Royal Infirmary. Once complete, it will provide some 1,800 rooms across 50,000 square metres of space (equivalent to 540,000 square feet). Designed to create an inclusive environment for both young and older patients with all levels of physical and cognitive ability, the five-storey structure includes a large atrium, shop and café, together with a spectacular skylight that links both of its entrances. This is the single largest project ever undertaken by HLM, one of the largest currently on site in Scotland for that matter – and its complexity led the project team to embrace UK Building Information Modelling (BIM) Level 2 from the outset. Watch our video here: www.youtube.com/watch?v=ONyvDc9Vhkl

A vision for the future of modular hospital design: structure and setting

This talk presents the philosophy and process of an integrated approach to address the key challenges in designing the hospital of the future with a focus on flexibility (structure), the sense of place (setting), and human scale (integration).

Highlighted are the results of masterplans from four major urban university hospitals in Germany, where a modular hospital prototype was implemented. The presenters will explain how the hospitals blend into the urban campuses as a city, within the city.

Most university hospitals in Germany have evolved over time into large, urban-based healthcare campuses with a mix of historic structures, outdated facilities and state-of-the-art healthcare centres. Today, they often face the same challenges: complex structural and technical conditions; complicated interconnectedness between departments; difficult orientation and wayfinding; and limited space for growth. Most facilities are currently undergoing a shift from hospitals that 'can do it all' to groups of specialised high-performance medical centres, which require flexibility and adaptability to support interdisciplinarity between services. To address this transformation, a shift from 'every building is different' with customised room programmes, to a modular hospital based on universal structure and a modular programme, is required.

This presentation visualises the interrelation between universal structure design and the special character of each hospital site. The hospital campus should function both as part of a developed city structure and as its own urban network, thus blending into the surroundings and interweaving with nature. Despite the differences in their architecture, location and campus, the proposed modular hospital is based on fundamental design principles. Its concept is similar to a traditional urban layout featuring streets, courtyards, partial plantings and low buildings – structures that can lead to an innovative and articulated approach to new clinic space design.

Tools, such as mapping and user involvement, are used to understand the interconnectedness of medical and economic goals with structural and technical conditions, by cross-mapping parameters such as space, capacities, effectiveness and potential.



Edzard Schultz (Germany)

Partner
Heinle Wischer and Partner



Eva Henrich (Germany)

Architect, healthcare
architecture
Heinle Wischer and Partner



Susanne Glade Dipl. Ing
(Germany)

Architect, planning
GO+ architekten

Tobias Buschbeck Dipl. Ing.
(Germany)

Architect, planning
Tobias Buschbeck Architecture

The Danish patient: a comparison of the architectural structures of hospitals in the 1960s, 1970s and in 2020 in Denmark

This study was developed between 2011 and 2012, published in 2012, and will be completed this year with the assessment and evaluation of the first completed projects.

Objectives: The research aims to understand the future direction of hospital design in Germany and Europe by focusing on Denmark's experience – in particular, how innovation of technology and function influence hospitals' architecture. This progress has technological and operational impacts on economy, efficiency and quality of workspaces.

Both Denmark and Germany are facing similar healthcare challenges, including: demographic change of patients and staff (ageing population); constantly evolving medicine and technology; limited financial resources in relation to the high costs of medical technology; increasing staff shortages; and outdated and obsolete hospital structures. To address this situation, Denmark is embarking on a radical restructure of its healthcare system at the political, structural and functional levels.

Method: The study was developed through interviews, workshops and round-table discussions with all participants, with a comparative analysis of the different design solutions in the same drawing scale, visits of project sites, and diagrams.

Results and conclusions: In 2008, the Danish Government decided to develop and implement a masterplan by 2020 to provide a new national hospital organisation and infrastructure, underpinned by a €5.5 billion investment programme.

The guiding principle of Masterplan 2020 is "quality of the hospital rather than short distance to patient", and Denmark is investing vast sums to restructure the hospital landscape towards a more concentrated arrangement. In contrast to Germany, where single masterplans are applied to every individual case, the Danish experience is a global vision that guides the process of change. It provides a new healthcare infrastructure for all populations and aims to offer a unitary solution to future healthcare challenges.

Keywords: Vision Denmark; Process planning; Centrality of patient

Cancer Centre at Guy's Hospital: the patient voice – is the design better because of it?

The Cancer Centre at Guy's Hospital is a £160 million development at Guy's Hospital in southeast London. The trust held a RIBA design competition for a contractor-led design team to design and construct an ambulatory cancer centre for provision of radiotherapy, chemotherapy, outpatients, diagnostics and therapeutic support in 2010.

Patients have been instrumental in the design of the facility, through an active patient reference group of more than 30 members. Patients were involved in the selection of the team, the design user groups, furniture, and arts commissions. The chair of the Patient Reference Group sat on the programme board as part of the project's governance structure.

The question posed in this set of presentations is whether the design is better as a result of this patient involvement. When the centre opened in September 2016, the trust sought patient views through questionnaires, before undertaking focus groups with patients early this year to review the design development and the facility in use. The output of these focus groups will form part of presentation 1.

Presentation 1: Patient engagement and involvement

- Process – how and why
- Briefing
- Key inputs and decisions taken throughout the design
- Feedback from patients on the use of the building
- Outputs from the focus groups

Presentation 2: Technology, design and architecture

- Integration of the latest high technology and patient-centred design – how cancer centre design needs to balance technical aspects with patient-centred design and support multidisciplinary care
- How patients worked with the design team – role of patient groups from inception of the design process through to detailed workshops
- Impact of patients' views on the design itself – patient voices underpinned the village concept, the science of treatment and art of care zoning, as well as access to daylight and nature

Presentation 3: Cancer treatment and service transformation

- Cancer treatment
- How patient pathways have been managed and transformed
- Information technology as an enabler to service redesign



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The art of care – integrated art and design at the New QEII Hospital

This paper will explain the process for integrating art and design for wellbeing into the overall architectural design concept for the award-winning New QEII Hospital in Welwyn Garden City – from the initial design competition through to completion of the building.

It will explain the engagement process with an extensive stakeholder group, including patients, staff and third-sector representatives, with reference to the integrated design and arts strategy. It will also illustrate, through patient and staff feedback received in the first 18 months of operation, how this approach is positively influencing the daily experiences of families, visitors and staff.

The New QEII Hospital is a substantial re-provision of hospital activity, bringing together existing and new services in a purpose-built facility. It's part of a wider clinically led strategic estate and service reorganisation across the NHS in Hertfordshire, providing the opportunity to deliver new models of care by integrating primary, acute and social care services for this community. This project exemplifies the current reforms in the NHS and the Five Year Forward View's emphasis on wellbeing, sustainability, integration and efficiency.

Designed around the wellbeing of patients, the New QEII is an exemplar of low-energy, sustainable design, achieving BREEAM Excellent. The building design boldly integrates the work of several artists to inspire, stimulate and create a compassionate human scale.

A generous, covered plaza leads to the main entrance with central reception, café, pharmacy and community support facilities. The triple-height main entrance space, with vibrant mural, is light and open, connecting the external plaza spaces and the landscaped central courtyard. Colour theming, based on the mural, leads to department receptions and calm sub-waiting zones arranged around the courtyard, linked by internal open voids.

Inspired by patterns and designs found in the local area, the artist created full-size ink drawings, which were then translated into 125 laser-cut window screens, providing not only practical control of ventilation and security but also a beautiful articulation of art and craft integrated into the architectural design.

The new Bispebjerg Human Hospital patient experience: designing a new Danish standard

The Bispebjerg Somatic Hospital of the New Hospital and Mental Health Bispebjerg contains several buildings and projects involving new construction, preservation and renovation. On its completion, it will meet the demands of the city of Copenhagen, Denmark.

The project consists of six bed towers containing 600 patient rooms, which connect to a diagnostic and treatment base that reflects the existing historical buildings while creating a new architectural language. This presentation will provide an in-depth look at the project and how its patient experience will be reflected in the hospital design and create a new Danish standard.

The presentation will explore the Bispebjerg Human Hospital project site, and how the listed buildings and indigenous species on the hospital grounds helped formulate the winning design for the new hospital. Attendees will learn about the client's vision and principles for the project, and how these were answered in the two-year competition phases.

Delegates will also learn about:

- How wayfinding played a critical role in the design team's response to the client's vision, as well as providing the foundation for the patient experience;
- Issues with varying room designs and layouts, and how the design team settled on the new Danish standard – the single patient room; and
- The process and flexibility of the design, from the two competition phases through the recently submitted schematic design phase.



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Taking the “ouch!” out of emergency: using illustrative and digital arts to guide, reassure and role-model behaviours at the children's emergency department, Evelina London Children's Hospital

Background: The art scheme for Evelina London Children's Hospital's emergency department aims to bring reassurance and stimulation to families and children, ensuring they feel well-cared for throughout their journey, as well as promoting role-model behaviours and acceptance of information.

Methodology: After conducting an environmental psychological study, the research team spent two weeks on site, building up a 24-hour picture of the service. Workshops and feedback sessions were held with staff, patients and families, leading to strategic principles and design prototypes. Role-modelling theory also underpinned the work. The scheme was installed in late 2016.

Outcomes: The project features:

- 'Info slices' – strategically placed bodies of text, which inform patients at the point of need, in language they understand.
- A 'gang' of illustrated characters, generated in partnership with children and clinicians, which feature in an interactive, playable app that helps to demystify the emergency process.
- The characters fully integrate with the environment, popping out from doorways, across walls, creeping on to ceilings, and appearing on stickers handed out to children. They function as wayfinding aids and carriers of information, providing reassurance and comic relief.
- Bodypaint: a digital interactive installation that facilitates play. Projected on to a large wall, the piece delights users with its colours and shapes, which move and transform in response to body movements.

Implications: By June, the trust will have carried out a detailed evaluation of the new service. We'll discuss these findings, along with project learnings, including:

- Characters in apps and digital art can role-model clinical scenarios for children in a friendly, entertaining way, helping reduce anxiety and possibly leading to better interactions between doctors, family members and children.
- Modelling other scenarios helps educate parents/children and may have long-term public health benefits.
- The traditional term 'art coordinator' is flawed, so we'll consider how the role should be rethought to better suit complex healthcare challenges.

Case study at HM Nuevo Belén hospital in Madrid – comparing two different healthcare design concepts in the same maternity building

The hardest thing in healthcare design is not changing the built environment but changing mentalities. Only by combining evidence-based design and evidence-based childbirth care can we achieve good results. While birth rates in Spain are falling and women have new demands, our aim with the client was to secure long-term sustainable service and business – ‘better births = more births’.

Situated in the heart of Madrid, Nuevo Belén hospital is a small, traditional maternity clinic. The project to create a new birth unit at the hospital has been a fascinating project; not only was a new space built but the input and interests of medical professionals who now work in childbirth were also catered for.

While this project was under development, the hospital decided not to risk its traditional way of attending births in the central surgery area, so this continued unchanged while the new birth unit was built. This provided an optimal situation to compare two very different maternity ward concepts in one and the same building, both managed by the same medical director.

Through proactive teamwork, everybody in the hospital was prepared for the changes while the construction work was carried out. The birth unit opened in September 2013, since when data on birth outcomes have been collected.

Specific conditions are needed for a good birth room: natural light and views; silence; privacy and good internal connections to surgery room; NICU, etc. An empty hospital wing on the ground floor was selected, with eight patient rooms converted into the new maternity ward.

These new spaces made it possible for professionals to work in a completely different way. We're also now observing some fascinating project side-effects, with some features spreading to the hospital's traditional obstetric areas.

This project will be presented as a case study, focusing on certain details and sharing results on how these changes can affect or alter clinical attention.



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Keynote address: Maggie's Cancer Caring Centres – the value of design in maintaining the joy of life for people living with cancer

Maggie Keswick Jencks lived with advanced cancer for two years. During that time, she and her husband Charles Jencks worked closely with her medical team, which included oncology nurse Laura Lee, now Maggie's chief executive, to develop a new approach to cancer care.

Maggie's Keswick Jencks' vision was for a non-clinical place in hospital grounds where people with cancer, and their families and friends, could find practical, emotional and social support. Today, there are 20 Maggie's Centres across the UK – and in Tokyo and Hong Kong – designed by leading architects and founded on her belief that people should not “lose the joy of living in the fear of dying”.

In this keynote address, Laura Lee explores Maggie's design and care philosophy, as well as the evidenced impact these amazing spaces have on the physical and mental wellbeing of people living with cancer.

As Laura shares Maggie's remarkable story and the charity's trail-blazing journey spanning the last 21 years, we will hear how great architecture and design have enabled Maggie's Centres to create calming and supportive environments, in which 220,000 visitors every year receive high-quality, people-centred care and support.

Strategies for tackling the super-ageing process in a welfare society: policymaking, welfare technology and refurbishments in the Sweden of 2040

Most senior Swedes can expect to age in a healthy manner, statistically reaching a turning point in their early 80s. But the average ageing process has changed appearance.

Since the early 1990s, dementia has been the dominant reason for older people to apply for elderly care and move to a residential care home. Changes in the ageing process will also change the composition of the Swedish population. In 2040, the proportion of people aged 65 years and older will be above 23 per cent, slightly exceeding the proportion of children and adolescents. This study explores how policymaking between 2011 and 2016 made preparations for the arrival of the super-ageing society.

The research material constituted governmental bills and propositions relating to senior Swedish citizens' living conditions, while an increase of available flats in residential care homes was also included. The research material was subject to a close-reading process in combination with a thematic analysis. Similar to most Nordic countries, Sweden envisages continued ageing in place; building on old ideals of the Folkhemmet (people's home) of the 1950s, this corresponds with a concept of 'dignified ageing'. This implies a continued independent life in a familiar setting, with access to municipal elderly care as a civil right in the case of special needs.

Ironically, the building standard of the 1950s also underpins the décor to this scenario: mostly three- or four-storey-high buildings in suburban areas without elevators, or occasionally equipped with elevators that fail to meet modern requirements on accessibility. In combination with an alarming housing shortage, compact living, co-housing, multi-generational housing and refurbishment are projected solutions. ICT products, robots and other artefacts, which exemplify the meaning of welfare technology, will ensure safe and secure ageing in the welfare state of the 2040s. This realisation will require the following mantra: let's app-ify!



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Development and test of a methodology for the investigation of stroke patients' rehabilitation in home settings

In Sweden, one of the major healthcare transformation challenges is the transfer and effectiveness of services outside specialised hospital units; for example, rehabilitation activities for stroke patients are no longer performed in stroke units but now often occur at home.

The beneficial effects of early support discharge (ESD) are explored, addressing the importance of patients' centrality and participation in the rehabilitation process, social interactions and atmosphere, treatments planning, and coordination. The International Classification of Functioning framework also suggests the importance of the physical environment in supporting individual functioning. But, at present, there is a paucity of knowledge on what physical aspects of home settings facilitate rehabilitation processes for stroke patients.

Objectives: The aim of this work was to reduce this knowledge gap by developing and testing a methodology that could advance understanding about the interaction between the physical environment of home settings and patients with stroke experience. The individual experience of the environment was conceptualised in line with insight from environmental psychology, which entails information on emotional-cognitive responses and wellbeing-related outcomes.

A research protocol was developed based on collaboration across different disciplines. Plans were developed for a longitudinal study design, in which the protocol would be tested on about 30 stroke patients on two different occasions, at one month and six months after stroke onset.

Method and results: A single approach based on mix methods and multi-perspective strategies was developed. The former refers to the use of different tools (eg observational technique, behavioural mapping and interviews) to grasp the effect of the physical environment on users' perception of social support, emotional-cognitive responses, and rehabilitation and wellbeing outcomes. The latter strategy entails the collection of information from different social actors (eg nurses, patients, family members). A detailed description of the protocol, its applicability and results will be presented.

Conclusion: The protocol informs a relatively unexplored area of research by investigating the role of the physical environment in supporting stroke patients' physical and psychosocial rehabilitation processes.

Making frailty a priority: experiences of an innovative GP-led multi-disciplinary approach to frailty within secondary care

We demonstrate the importance of facilitating a 'transition of care' for frail patients through use of a central multidisciplinary hub.

This presentation is based on the experiences of an innovative GP-led multi-disciplinary team (MDT) based in secondary care. It highlights the importance of supporting a 'transition of care' to prevent admissions via GP liaison nurse, and reduce readmissions via MDT and community follow-up.

Relevance and impact: Frail older patients are vulnerable, complex and prone to dependency. Recurrent and prolonged hospital stays are detrimental to patient wellbeing and costly to the NHS economy. Over 50 per cent of readmissions were occurring within the first seven days of discharge. These factors drive demand for fully integrated MDTs working to facilitate a 'transition of care' between primary and secondary care, ensuring appropriate care is delivered in the appropriate place.

Through working collaboratively with various healthcare professionals and providers, social care, and the voluntary sector, we're able to identify patients' needs in a holistic manner, and this collaboration is augmented through inter-professional learning.

Outcomes: Patients whose transition of care was facilitated through the MDT process had an average length of stay of 5.1 days and a readmission rate of 17.6 per cent. This reduction in length of stay and readmissions, compared with an age and presentation matched cohort, represents a potential reduction of more than 4000 bed nights in the past three months.

Discussion: Outcomes suggest patient and cost benefits are generated as a result of collaborative working. Positive early signs and support from the trust and wider health community have secured funding for ongoing development.



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Urban elder care

This colloquium will show how architects and care providers around the world are starting to challenge the insular medical-model nursing home and its de-humanising impact on the ageing individual.

Architects are producing radical new designs that support normal life in an institutional setting. Four architects working in four different countries will present schemes at various stages of design:

Case study 1 (Denmark): New Sølund in Copenhagen is an example of how city-integrated care centres can give the elderly opportunities to live and interact with other generations. Sølund's mix of housing types combines: 360 care homes; 150 youth dwellings; 20 senior dwellings; a children's daycare centre; micro-shops; cafes and workshops – a true 'house of generations'.

Case study 2 (Norway): Architects have carefully woven a mixed-use housing complex into the centre of Drøbak, Norway. The complex incorporates various communal areas to encourage interaction between its elderly residents and the wider community – for example, through a 'Night Garden' complex with garden allotments, and a public square, shops and restaurants.

Case study 3 (Singapore): The HomeFarm project in Singapore brings together aged care living and urban farming. A sinuous band of lived-in garden terraces undulate around an urban farm, providing vocational gardening and growing activity, and community engagement. The older generation is housed in a community with children and young adults living alongside.

Case study 4 (Canada): The Heather Street project in Vancouver shifts care processes from a medical model to a social model. Beginning in the private room, where the resident can regain the role of host, this transformation extends into the social space, where meals are prepared from scratch, and which is fully realised through freedom of access to a public realm.

The architects will discuss how they've reinterpreted their responsibility to their clients – the residents, caregivers and urban communities in which their projects are embedded. Each architect will address the challenges in designing life-enhancing elder-care environments: freedom/autonomy; normal/exceptional life; and retreat/community integration.



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Design for building an engaged, inclusive and resilient residential aged-care workforce

In 2016, a University of Melbourne Hallmark Ageing Research Initiative seeding grant provided the opportunity to examine which characteristics of residential aged-care (RAC) facility workplace design contribute to building an engaged, inclusive and resilient workforce.

Method: The research was conducted at a RAC facility in Victoria, Australia and involved:

- 1) Photo-elicitation with staff, who were provided with a tablet and invited to take several photos of the workplace environment that made them feel valued, productive, safe, like they belong, and connected with other staff;
- 2) Group discussions with staff who had taken photos to discuss their experiences and views about the photos; and
- 3) Interviews with senior facility directors to explore which workplace design features work well and which could improve workplace design, to build an engaged, inclusive and resilient workforce.

Results: RAC staff took 29 photos, including:

- 1) Objects – paintings, vase with flowers, caged bird, couch, wishing well, bookshelves, decorations, lead lighting;
- 2) Dedicated rooms – staff meeting room, upstairs offices, staff room, staff kitchen, residents' hair salon, chapel;
- 3) External spaces – garden beds, gazebo, fountain, pathways; and
- 4) Public spaces – front entrance, car park.

Group discussions revealed four categories of design features that made RAC staff feel valued, productive, safe, like they belong, and connected with other staff, including: 1) having a home-like environment; 2) having access to outdoor spaces; 3) having access to dedicated safe and open workspaces; and 4) the indoor quality environment.

An interview with the care director revealed four categories of workplace design features that worked well, didn't work well, or could be improved, including: 1) having a home-like environment; 2) having safe, open workplace 'zones'; 3) lack of staff facilities; and 4) the need for more comfortable spaces for staff.

Conclusions: The research revealed workspace design features of RAC facilities that influence staff providing care for older people. These have potential implications for RAC facility policy (eg design standards), practices (eg home-like environment) and research (eg assessing RAC workspaces using Vischer's environmental workspace comfort model and setting priorities on investing in design improvements).

Designing a strategic masterplan for age-inclusive communities

This presentation will discuss how greater consultation, active collaborations and better planning of homes, communities and the built environment can improve the quality of life for all generations, cut health and care costs, and lead to a more sustainable, integrated society. Age-inclusive communities facilitate the connection of older people to their family, friends and carers, enabling people of all ages to stay active and healthy, and providing support for those who cannot live independently.

Six themes were identified as key drivers shaping the context of ageing:

- community support and care network;
- technology and product innovation;
- connectivity, access and mobility;
- housing and environment;
- mental and physical wellbeing; and
- sense of security.

Change can be influenced through physical intervention – housing design, urban environment design, transport and mobility solutions, business model-led approaches, and financial incentives; and consultative forum – local partners, not-for-profits, healthcare providers and commissioners, social services providers, and local authorities.

In its 'alternative age-friendly handbook', the Royal Institute of British Architects (RIBA) identifies eight domains of an age-friendly city, covering aspects such as outdoor spaces and buildings, transportation, and respect and social inclusion. Studies have also been commissioned to understand how cities and neighbourhoods can support healthy and active living for different groups of older people, so they can feel safe, secure and socialise. This shows that we can create supportive environments and influence the physical and mental wellbeing of the ageing process.

This and other work provide a framework for the design community and built environment professionals to co-develop concepts, products and services that can facilitate lifelong independent living, and thus challenge the current model of care in the context of an ageing urban society. This work has been presented at the Agile Ageing Alliance (AAA) Neighbourhoods of the Future, European Commission outreach programme. AAA has been exploring new paradigms for active and healthy ageing through innovation workshops across Europe, accelerating development of products and services that promote choice and flexibility of care in age-inclusive communities. The next step will be to create a reference framework of active ageing.



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Technological advances and the healthcare estate

This presentation will demonstrate how 'big data' solutions, developed through cognitive processing, can offer significant benefits – for example, by offering clinicians access to vast knowledge and experience.

However, progress does not come without risks – one of which will be the regulation and testing of the thousands of apps readily available. Such issues will become even more complex as the mobility of data on smartphones, tablets, etc increases. Data will need to be location-independent and holistic. Clinicians, social workers, carers, and even patients themselves may become actively involved in managing their health records. How do we ensure patient confidentiality?

Alongside technological advances, other shifts in society are occurring. These will be reviewed to determine the consequences for the emerging and/or established models of care. Some aspects will suffer; others will be embraced owing to changing behavioural patterns and demographics, as well as the shifting work and life patterns of clinicians, their support staff, and patients themselves. Several disciplines will need to work together to create an effective network for diagnosing, monitoring and management of the patient.

The impact of these changes on the healthcare estate will also be reviewed. There may be new ways of working that have a significant impact on healthcare delivery, which will determine the type of facilities needed. Emerging lifestyle trends, the changing use of technology, and advances in diagnostics and treatment will create opportunities for new healthcare provision. The opportunity of a 'lean', more personal, less intrusive and, potentially, more portable healthcare solution could radically change the healthcare estate. The question is how to plan for it when the outcome is so fluid.

We'll look to the future through the case studies published by Nesta in its paper, 'The NHS in 2030'. Using these narratives, the interaction of individuals with the system will be further explored, from the different perspectives outlined above.

The impacts of population health analytics on hospital and outpatient clinic designs

There is a general shift towards preventive care with growing demand for accountable and coordinated care.

Objectives: Population health describes a new method of providing care by identifying a population and predicting what their health needs may be, and providing customer care pathways for high-risk members prior to them needing to receive care at an acute hospital. The idea is to produce a healthcare service that doesn't start and finish at the hospital door, but intertwines all aspects of community and primary care.

Method: Designers are using predictive analytics in population health to reconsider the traditional hospital model, by reducing footprints and moving outpatient clinics into the community.

Acute hospitals and ambulatory organisations need innovative solutions to help them transition to value-based models, and their success will depend on how well they manage the health of their populations. Providers will need to co-ordinate high-quality care across the continuum, increase patient engagement, improve health outcomes, and reduce costs. This will depend on them having the right technology solutions.

Results: A sound population health technology will help improve health outcomes and reduce costs by identifying high-risk patients, and enabling efficient co-ordination of evidence-based care through automated workflows and access to patients' longitudinal records.

The same technology can be used to provide information for care team members and decision-makers when and where they need it. As we need to build hospitals that lend themselves to acute patients only, our current design standards/ratios must be reimaged around a new definition for outpatient care. The functional programme must change to accommodate this new reality for true savings to be achieved.

Conclusions: There has been a rise in general practitioners wanting to be 'inside' a continuum of care – standalone emergency departments as part of an overall system approach, standalone radiology to hospital visits, and standalone day surgery centres. What is the business case for realising savings and what are the key drivers to make the outpatient approach affordable?



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Best practice for implementing integrated technologies in healthcare

Most healthcare now depends on IT and communications (ITC) technology in some form, and new requirements and technology are continually being introduced. In addition, healthcare facilities incorporate an increasingly wide range of technology systems to support effective operations and improve patient experience, for example: wireless staff communications; automated dispensing; building management systems; wayfinding; security systems; mechanised logistics systems; and real-time materials tracking.

All too often in healthcare, ITC systems are fragmented, difficult to inter-operate, and not linked beyond the four walls of the facility, preventing the wider benefits across a population from being realised.

Framework: A whole systems approach is required, integrating people, process, environment and technology. We have developed a systems model for a holistic approach addressing all elements of the total system to inform successful design and operations.

Description: In this presentation, I will introduce a process and a series of tools used on the planning of healthcare facilities in the UK, Ireland and Canada. These include:

- stakeholder identification and engagement;
- responsibility definition;
- business process mapping;
- system integration scoping;
- integration matrix; and
- specifying and procuring integrated systems.

Outcomes: Open, interoperable and scalable solutions that enable excellence in healthcare and greater operational efficiency. The ultimate goal is not only to deliver successful integration but also to enable the digital (real-time) hospital – and to take this beyond the physical walls of a building. This has a centrally planned and executed technology strategy that enables clinical decision-making and operations to respond to real-time data, and react accordingly.

Implications: A systems approach is necessary for the planning, specification, procurement and implementation of ITC. This should start from the earliest stages with an ITC masterplan. New roles are required to define and deliver systems integration. ITC requires a different process than that used for buildings design and delivery; however, the dependencies and points of information exchange between the two processes must be carefully planned for success.

Innovation and the new Alder Hey

The effort of developing a new hospital creates a ball of energy, which can easily diffuse once the project is complete, leaving a shiny, new building but little else in the way of impact. At Alder Hey Children's Hospital, this energy has been channelled into an innovation generator/hub. This generator lives in a 1000 sqm 'bat cave' beneath the hospital park but its presence is felt around the country and abroad.

The approach involves a core of clinicians and an associated but changing group of clinical entrepreneurs charged with 'quick-strike' innovation, spreading ideas, connecting with other like-minded teams in industry, academia and health systems, and, most importantly, avoiding the pitfalls of a closed shop or single team grappling with all-comers over IP.

This has created a chain-reaction of innovation leading to the rapid development of innovation networks and partnerships around Alder Hey. The core principle is that everyone and every idea are welcomed, and attempts are made to find the right home for these ideas and their creators.

Innovations include:

- personalised accounts for children, who, prior to arriving at hospital, can create characters online who appear in their hospital bedrooms, operating theatres, etc;
- artificial intelligence and cognitive computing, which allow the children's characters to sense moods and react accordingly, as well as creating an opportunity to sweep information from across the hospital and deploy it for the benefit of patient experience;
- sensor development, including the placing of sensors on a patient's skin to detect the contents of blood and avoid the need for jabs;
- healthy living innovations aimed at promoting and improving health across the spectrum for children and families;
- virtual reality and the application of 3D technology to pre-operative planning and hospital care; and
- an apps generator, funded by venture capital and manned by a gaming company, which works with Alder Hey to generate a pipeline of new apps to solve staff issues.



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Case study: Sahlgrenska University Hospital Imaging & Intervention Centre

Completed last year, Sahlgrenska University's Hospital Imaging & Intervention Centre in Sweden is described as the world's first hospital to accommodate the latest imaging equipment and treatment for cancer patients within the same building.

The objective was to streamline the imaging procedure to allow several specialists to focus on patient needs simultaneously. Traditionally, imaging and surgery are housed in separate locations within a building, but in this new facility, imaging and surgery can be undertaken in the same space. One of the key objectives was to bring the equipment to the patient, increasing safety and comfort at critical times.

Treating patients in one place

The facility provides the world's most advanced equipment in one place, including a ceiling-mounted movable MRI scanner, X-ray, ultrasound, CT, and PET. Below ground level, a cyclotron supplies PET scanners with radioactive isotopes. New operating rooms house advanced machines that perform diagnostics during operations without having to move the patient. Images are displayed on monitors in the room, allowing specialist clinicians to be in different locations and monitor the operation in real time.

Fit for the future design

The hospital is designed to adapt to future medical advances with robust and flexible solutions that will enable continuous changes in usability. The eight-storey building comprises two parts, each with its own power supply to ensure independent redevelopment if required in future renovations, and to provide full redundancy.

Proximity of imaging equipment

Key to the design was ensuring the unusual proximity of the operating rooms, as well as shielding against any interfering radiation. An optimum spatial structure was created to provide an effective workspace for clinicians and assure operational security for patients. Thorough instructions on installing key medical equipment were prepared at the design phase.

Conclusions

This world-class imaging and intervention centre provides Sweden with much greater capacity and state-of-the-art facilities for cancer research and development, faster diagnosis and treatment, reduced healing times, and minimally invasive surgery.

CARe delivered with Telemedicine to support Rural Elderly and Frail patients (C@RTREF – Welsh for ‘home’): co-designing responsive services with patients in rural healthcare as part of the Future Hospital Programme in Wales

The population of North Wales aged 75 years and older is expected to rise by 60 per cent by 2033, accounting for 16 per cent of the population. As many live in rural locations with poor transport infrastructure, a new model of care is required. Telemedicine has been used for patients of working age for many years, but less so with the over-75s. Factors known to enhance take-up of telemedicine include physician recommendations, while poor digital skills are a negative factor. Growing familiarity with platforms such as Skype point to an increased acceptability of telemedicine.

Description: Patients aged 75 and older were approached about having a follow-up with a single consultant geriatrician via telemedicine consultation. Frailty of patients was documented using the Canadian Clinical Frailty Scale. A digital inclusion officer (during the training phase) and a nurse supported the patient at remote sites (community hospitals), with the consultant 40 miles away at a district hospital. Patient satisfaction questionnaires were completed.

Over 18 months, 196 individuals between the ages of 75 and 104 were seen – 69 per cent (109) were transferred back to the GP for onward care; and 87 had clinical interventions ranging from alteration of medication to a ‘face to face’ consultation, or in-patient admission.

A fifth of consultations were via telemedicine, saving travel time of 1.5 hours and 80 miles per clinic – a saving of £1411 a year. The average travel time averted for patients equated to 66 minutes – a reduction of 42 miles, plus reduced costs to accompanying persons.

Additional clinics ranging from rheumatology, to high-dependency respiratory care, to movement disorder clinics have adopted the scheme, enabling high-quality, consultant-delivered care to frail elderly patients in rural locations.

Learning: The main challenge in developing such a service is to have a lay person who can talk the patient through the process and offer reassurance.



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Sound and acoustics in healthcare facilities

Over the last decade, noise levels in healthcare facilities have increased, and with more people and more equipment in facilities, and more complex tasks to solve, the physical working environment is challenged like never before.

All over the world, acoustic standards and guidelines are often lacking in healthcare facilities. If an acoustic standard or regulation does exist, room acoustics are normally evaluated on reverberation time (RT) only, despite the fact that humans are known to perceive much more.

For many years, a wealth of research and theoretical studies have shown that RT alone can be insufficient to describe the acoustic conditions in non-diffuse environments, particularly in healthcare facilities and learning environments where the majority of absorption is on one surface.

Acoustics are of particular importance to people with dementia, who suffer from cognitive deficits and react to noise in a different way to others. They often have a hearing-impairment and this, together with the dementia, can lead to confusion, distraction and problems with orientation – all due to sound. These can also lead to social isolation because a person with dementia finds it hard to deal with noise. Further research shows that physiological reactions to sound – irrespective of age – can also increase heart rate and blood pressure, and result in heavy fatigue.

This paper will present the latest knowledge on room acoustics in relation to the elderly and how sound affects people in healthcare facilities in general. It will also present an intervention study from a dementia clinic in Munich, where three rooms were acoustically refurbished with different products and solutions. The objective of the study was to measure and analyse relevant room acoustic descriptors (reverberation time, Clarity (C50), Definition (D50), Speech Transmission Index), and determine whether the changes had an impact on patient behaviour and/or an effect on staff members.

Interviews and measurements were conducted before and after the refurbishments, and a delayed post-test, involving staff interviews, was carried out in September 2016.

Emotional design for a healthcare robot and its app

This paper highlights ways to improve integration of the emotional component into the user experience for healthcare. From concept to final design solution, insights will be shared on the development of a visual language for an innovative healthcare product.

Background and objectives: The emotional aspect is often overlooked in digital healthcare experience design. Pillo – described as the world's first home health robot – was created to solve the challenge of medication non-adherence and help people manage their health and wellness.

The project aimed to create a companion – someone who would not just manage supplement and medication schedules but would help users feel empowered and cared for.

Prescriptions are scanned to create a tailored dosing schedule that strictly follows the doctor's orders. Pills are loaded in a step-by-step process, with on-screen guidance and spoken instructions. Sensors and machine-vision cameras ensure only the correct medications are dispensed at the right time. If a dose is missed, Pillo will notify caregivers.

The Pillo app manages supplement and medication schedules, sends and receives notifications, and curates personalised healthcare information on the go.

Method: We conducted active listening sessions with potential users from target groups. Most of the patient audience wanted to feel cared for while using the device. Users emphasised its reliability and simplicity of use, along with it being fun to use.

Results: The final version of Pillo is based on user feedback. The robot's key emotional expressions are interest, joy, curiosity, surprise and sadness. Pillo recognises and interacts with people, and can hear, see and understand them thanks to voice and facial recognition technologies.

Conclusion: User participation and engagement, as well as deep understanding of user emotional context, leads to the design of products well-equipped to communicate emotion and personality. Pillo is an example of how incorporating empathy and emotion into a product's design can help turn a routine task into a positive, caring experience. The app was launched at the end of last year, with the robot planned for release in July.



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Transforming our healthcare estate: developing a health campus solution for Townlands Hospital, Henley

This paper presents the case for designing a commercial structure that releases funding to both modernise and transform the NHS estate. The focus is to provide pointers for policymakers on how capital can be made available, and how the raising and investment of this capital is affordable.

A method of raising capital and investment, which is common in the commercial sector, is generating value from owned assets, either by selling those assets or leveraging value (borrowing) against them. Commercialising land, and even 'air-space', can generate capital which, together with revenue savings through new ways of working, can service the debt required for any new development.

This approach was adopted for the development of a new community hospital to replace a dilapidated health facility in Henley-on-Thames. Townlands Hospital sits on a 6.5-acre site of prime land value, close to Henley town centre. The original hospital site included listed buildings, which had to be retained. Successive business cases were unable to progress for financial reasons, and at one point the hospital was identified for closure. However, the NHS locally sought advice on how to secure the investment required for a new modern healthcare facility, which led to an innovative solution that delivered significant value for money.

The whole site was split into three sections. The first – the site of the original hospital – was sold freehold; the listed buildings were refurbished, and additional development around them was designated as private older people's housing, including extra-care. The second section was sold on a long lease to Order of St John to build a care home.

Income from these two transactions was used as a pre-payment on a lease to build and maintain a new NHS community hospital at no additional cost to the system. The commercial approach to designing the site generated significantly greater income than the original value of the dilapidated buildings.

The efficient health system of the future

Asked about the future of jazz, the late trumpeter Humphrey Lyttelton replied that if he knew it, he'd be playing it. Such caution in forecasting the future is sensible, particularly when it comes to how scientific breakthroughs are going to change our lives. Here, predictions have often been wide of the mark. In 1937, the American Academy of Science predicted what the future could look like, but it is now mostly remembered for what it failed to anticipate: computers, the jet engine, rocket science, nuclear power – and World War 2.

In healthcare, too, there has been both over- and under-selling of the impact of science and technology. A prime example of the former is what followed the mapping of the human genome in 2003, with extravagant predictions about a new era of personalised medicine. While this age is 'belatedly' on its way and will, as we illustrate, transform many care pathways, it will take place over a much longer timescale than the euphoric enthusiasts of the early 2000s envisaged.

So, should we take Steven Pinker's advice to social scientists and avoid forecasting the future or is there a constructive way to anticipate how – and when – science and technology will influence care pathways so that we can plan systems, workforce and facilities accordingly? In this presentation, it will be argued that the latter is not only possible but essential if we are to optimise the health gain return on investment.

A model healthcare system will be used to illustrate the combined, disruptive impact of a range of developments, including personalised medicine, self-management via crowdsourcing, remote monitoring, automation, hybridisation, and logistics. This will be considered alongside inhibitors of change to demonstrate that there is a range of possible futures, and that we have opportunities to shape one that is preferable. As Humphrey Lyttelton might have put it, the future is trumpet-shaped.



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Holistic healthcare design and why it matters

Background: Our world is transforming. We demand personalised, seamless experiences; we seek out high-amenity places; and we're becoming more consumer-minded. These trends characterise our desire for on-demand services and places that cater to our needs.

There are also trends in population health and technology requiring new services, new operational protocols, and strategic planning. For healthcare, we must address all of these trends simultaneously if we want to satisfy human needs and economic sustainability.

Objectives and methodology: North York General Hospital (NYGH) in Toronto, Ontario, seeks to meet the needs of patients, families and staff while driving growth. In planning renovations for their outpatient chemotherapy and paediatric programmes, NYGH and the design team first defined the ideal experience. Using a human-centred, co-design process, current challenges were turned into opportunities, resulting in 'experience blueprints' for each programme, which align with NYGH's strategic plan and culture while addressing users' needs.

For the chemotherapy programme, we found that patients and families need help redefining "normal", personal choice, and a hospitable experience. Concurrently, staff need an environment that supports their workflow. Solutions include: a 24-hour urgent-care line for those experiencing debilitating symptoms; introductory videos to minimise anxiety-inducing unknowns; and re-imagined protocols for quickly assessing a patient's readiness for treatment. Designing alongside staff also created a more efficient, safe workflow.

The paediatric programme user needs are quite different. Patients and families seek a collaborative care team, a personalised experience, and an appropriate environment. Big ideas include: remote technologies to update families; giving weight to telehealth through outpatient care teams; and supplies for kids to "Build a Bedroom", so they can personalise their space. Operationally, the programme is prioritising development of a short-stay unit, where patients can be monitored without being admitted.

Results and conclusions: The presentation will discuss how to gather user insights and how they can inform the ideal experience. They will explain the process' implications and how results are directly tied to NYGH's strategic plan, creating a true patient- and family-centred experience.

Sustainable by design

The NHS has a net expenditure of £118bn a year, health expenditure per capita has increased from £1868 to £2057, and hospital admissions have increased by 28 per cent in the last decade. This trend is neither sustainable nor acceptable. Significant change is required to generate the transformation necessary to reverse these trends and move towards a person-centred, health-based future.

Technological advancements are predicted to enable in-patient transactions to shift to out-patient ones, and onward to day care. The internet will enable care to take place in patients' homes where they are more comfortable, more likely to recover quickly, and more likely to avoid infection-related issues. Where will tomorrow's surgeon be based? Technology allows GPs to provide transformative services that are no longer based around face-to-face consulting room transactions. Where will the GP of the future be based? The potential for converging NHS funding and social care budgets for 'health' provides the opportunity for a funding platform to allow more remote care.

New technologies cannot be developed in isolation. If the NHS is to yield significant savings, they must be overlaid on to a redesigned, re-imagined NHS estate. Primary care and mental health facilities, care homes, and ambulance and pharmacy services will be part of a new healthcare eco-system, where technology and a new estates strategy work hand in hand to deliver better healthcare outcomes that radically reduce costs.

Technology will significantly change asset demands. People will need to change behaviours and consider how care can be transitioned to, and undertaken in, different environments. This presentation will consider the NHS estate of the future and how different forms of design can be harnessed as part of a new asset ecosystem.

Good design in many guises will become the backbone of a more sustainable NHS estate with technological innovation at its heart. A sustainable redefined NHS that is once again the envy of the world: sustainable through design.



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A specialist children's hospital with play in its heart and art in its soul

One of only four specialist children's hospitals in the UK, Sheffield Children's Hospital provides care for children in Sheffield and specialist care across the North of England. The hospital is located on a tightly constrained, steeply sloping, urban site, which is now in a conservation area, growing incrementally through a series of architecturally progressively poorer buildings.

Objectives: The development, which completed this year, delivers not only new facilities but also a clearer organisation, which enables full redevelopment over time as funding allows. Most importantly, it delivers a new type of environment where art, architecture and the internal and external environment are designed together in response to children's needs.

Methodology: The commission was procured through a design competition launched by the hospital trust in 2011. Both the briefing and design teams referred to the excellent 'Healthcare Professionals' Assessment Tool for Specific Hospital Areas' research project by the University of Sheffield's 'Centre for the Study of Childhood and Youth', funded by the Economic and Social Research Council.

The arts are fundamental to the design and are integrated into the building fabric. Competitively selected artists worked iteratively with the children and the building designers, providing solutions for the public spaces and children's bedrooms.

Results: The project delivers a building that not only enables high-quality medical treatment (the science of treatment) but also creates a joyful, light-filled environment supporting recovery through sleep, recreation and play (the art of care). The central roles of interior design, art and landscape design, from conception to completion and beyond, have created a new healthcare environment and experience for children.

Conclusion: Many hospitals are in a similar position, with old, inappropriate buildings on tight sites and restricted redevelopment budgets. Close co-operation between the trust project team, children, charity, arts co-ordinator, artists and architects has delivered a result that meets all the aspirations of the brief, while setting a new standard for future developments on the site.

Hopewood Park – an 11-year collaboration

The completion in 2014 of Hopewood Park in Sunderland was the culmination of collaborative design development over many years, showcasing lessons learnt from a number of high-quality, major capital schemes and valuable smaller projects.

Strategic objectives: Northumberland, Tyne and Wear NHS Foundation Trust (NTW) is now one of the largest mental health trusts in the UK. At the time of its formation in 2006, it inherited a large estate, in very poor condition, and one of its strategic objectives was to “modernise and reform services... providing first-class care in first-class environments”.

Now, following £50m investment in PFI and nearly £200m through the NHS ProCure21 construction framework, the vast majority of the estate is in good condition, with the inpatient estate rated among the best in the country. From the outset, each individual project was undertaken with full knowledge of the wider context and future-proofed to be sustainable for the changing needs of the trust for years to come.

This presentation will look back on the achievements of the client-architect partnership, including: the projects leading up to Hopewood Park, including Ferndene and Bamburgh Clinic; the lessons learned; and Hopewood Park itself. It will focus on the quality and functionality of the accommodation, as well as the benefits of design refinement gleaned from previous schemes.

Achievements: NTW's focused approach to design development and learning outcomes has enabled the trust's staff to provide better care for service users in first-class therapeutic environments. Measurable impacts include: a 60-per-cent reduction in violence in the PICU; a 34-per-cent reduction in falls in the dementia ward; a 55-per-cent reduction in seclusion; and an 'Outstanding' Ofsted inspection for the CAMHS.

In 2009, the trust sought views on providing improved mental health and learning disability environments in the Sunderland area. Hopewood Park is the result, improving the quality and functionality of inpatient accommodation while supporting modern methods of care delivery. Although Hopewood Park may be a culmination in design and build, it's only the beginning of years of transforming lives – personally, environmentally, financially and socially.



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Addressing the risks of major construction activity on a working acute hospital site

This presentation will explore the challenges and risks associated with significant hospital construction projects taking place on the sites of working acute facilities. The talk will focus on practical measures to ensure patients and families continue to enjoy a safe, high-quality experience despite the potential disruption that construction activity may cause.

As well as discussion of construction methodology that minimises risks, the presentation will consider: three case studies; mitigation measures to reduce risks; and organisational processes, liaison arrangements and escalation procedures developed to manage the interface between construction and operations. The case studies are:

- The Royal London Hospital, Whitechapel – this major redevelopment of a busy East London hospital required the demolition of multiple buildings adjacent to the working hospital prior to construction of a new 17-storey building. The demolition and construction activity were in close proximity to the neonatal intensive care unit, and therefore posed significant risks to some of the hospital's most vulnerable patients; it's the measures taken to protect these patients that will receive particular attention.
- The Royal Hospital of St Bartholomew, City of London – redevelopment of Britain's oldest hospital required phased construction over a period of ten years to maintain the working clinical departments while building a cancer and cardiac centre. This case study will examine the challenges of phased construction and the necessity of engaging with hospital operational leads and clinicians to manage high-risk construction and building integration activities. There will also be discussion of meeting requirements for collecting and cataloguing archaeological material while seeking to reduce delays in construction.
- Great Ormond Street Hospital, Bloomsbury – the most recent phase of construction has involved the demolition of a building directly above the hospital's imaging department. This case study will present the mitigation measures taken in the demolition phase to ensure that the department was able to remain operational throughout.

In conclusion, consideration will be given to contractual arrangements that provide clarity of expectations for all parties, while recommendations for future practice will be proposed.

From P21 + Repeatable Room and Standard Component iPad and web application to P22 VR hospital

In response to the UK Government's Construction Strategy (to reduce capital and whole-life costs, project durations, and carbon) and Soft Landings agenda (to improve environmental, financial and functionality performance of buildings), as well as the Lord Carter Review (to improve efficiency and productivity), ProCure21+ and ProCure22 have developed 24 evidence-based and experience-grounded repeatable room arrangements.

These arrangements are collaborations of not just the Department of Health and six principal supply chain partners (PSCPs) but also of NHS trusts, Royal Colleges, patient groups, clinicians, academics, estates teams, PSCP members, and many other stakeholders.

Description: To aid in the communication and consultation of these repeatable room arrangements, an app (for iPads and Web browsers) has been developed that allows individuals to 'virtually' explore each room through 360° while interacting with different components. A CGI fly-through video of each room type explains the key features.

Each room is digitally built from federated BIM files produced during the development process with stakeholders.

Outcomes: The digital representations of each repeatable room arrangement have allowed the designs and benefits to be explained to, and understood by, patient, staff and clinician groups in ways that: reduce time otherwise spent in design workshops; lead to better and more informed decisions; and ensure greater satisfaction with built projects. Use of the repeatable rooms has also released design and consultation time to focus on finessing the overall department flow, functionality and effectiveness.

Moreover, staff training and familiarisation time is reduced; staff efficiency and productivity are realised sooner; and benefits are seen ahead of plan.

Implications: The next step is virtual reality – a 3D experience that immerses the user into virtual-reality rooms, a complete ward or department, which can be navigated as in the real world. In future, this will allow: digital rapid prototyping of further repeatable room arrangements and updates; testing and proving of local choices; scenario testing arrangements in real time with stakeholders; training of clinicians to operate in and maintain facilities; and engagement with, and feedback from, patients and stakeholders.



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Managing Change

Planting the right trees in the right place can help our cities improve air quality, making us all healthier. Just like good health, good healthcare design starts with getting the basics right. At AECOM, we understand that success lies in seeing the whole, nothing works in isolation.

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Keynote address: Co-creating knowledge where art and science collide

Solutions to the healthcare challenges of the future cannot be developed by experts alone. We need new approaches and methods that are not only based on the latest evidence but also empower patients, families and citizens to help shape policy and practice.

Science Gallery London is a new space where art and science collide, and it opens next year in King's College London. Aimed primarily at those between the ages of 15 and 25, but open to all, it will commission seasons focusing on health, biomedical science and beyond – allowing audiences to drive the content and tell the stories that make sense to them.



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Keynote address: The 100,000 Genomes Project: the start of personalised medicine

The 100,000 Genomes Project is the landmark programme bringing personalised medicine to the NHS.

Through sequencing the DNA of about 70,000 people affected by rare disease or cancer, the project will provide advanced diagnostics for NHS patients, undertake research, and establish the infrastructure for a genomic medicine service in the NHS.

The UK will be the first country in the world to bring whole genome sequencing into routine healthcare, potentially making personalised medicine a reality for all.

Creating healthy communities – insights from the NHS' Healthy New Towns programme

The Five Year Forward View (5YFV) set an ambitious path towards sustainability and transformation in the NHS. Born out of the 5YFV, the Healthy New Towns (HNT) programme comprises ten demonstrator sites totalling about 70,000 newly constructed homes.

The basic premise behind the programme is: can we 'design-in' health and wellbeing into new communities? In responding, a number of perspectives need to be considered, including: physical design of communities; new models of care; digital health; behavioural change; and organisational change and business transformation.

The HNT programme is about one-third into its initial three-year funding commitment. This paper will address the key learnings to date, including challenges and opportunities in working in partnership with the ten towns.

The learnings extend across several Congress themes, including:

- Challenging assumptions and redesigning the future of healthcare – the HNT programme has placed a diverse set of stakeholders who, traditionally, haven't interacted within a supportive environment to drive an ambitious health and wellbeing vision.
- Quality improvement – working with a number of sites, new models of care are being developed specifically around the citizen.
- Care in the community – designing across the care continuum to create flexible, integrated care systems.
- Healthy ageing – some sites have specifically focused on dementia-friendly communities.

Outcomes: This paper will describe progress in achieving the outcomes of the programme, including:

- improving health outcomes, social cohesion and health inequalities;
- improving and facilitating independence for people needing care;
- developing a model for healthy built environments that can inform other new developments alongside adaptations for current urban areas;
- creating international exemplars for new town developments;
- generating innovative care models that use the full scope of new technologies; and
- developing the NHS' approach to the planning of healthy places, including the development of NHS surplus land.



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Herston Quarter Redevelopment: supporting new models of care through positioning, partnering and placemaking

Since the decentralisation of the Queensland Health system regional health boards across the state have been defining new models of care and delivery, including the needs and direction of their health precincts and facilities. In 2014, the Queensland State Government and the Metro North Hospital and Health Service commenced the search for a development partner to redefine the future of almost six hectares of Brisbane's largest health precinct at Herston in Brisbane.

This presentation will explore the rationale, process and outcome of what will become the Herston Quarter Redevelopment – a 'health precinct plus' that: delivers new services; uses co-location, adjacencies and partnerships to boost value; and creates a new precinct that allows health, research, education and the city to co-exist for the betterment of patients, staff and visitors.

The AU\$1.1 billion Herston Quarter Redevelopment will be delivered in partnership with Australian Unity. It will deliver a range of new health and biomedical uses, complemented by a private hospital, student accommodation, residential, child care, consulting, and a wellbeing precinct providing high-quality accommodation and wellness facilities for an ageing population. The new Specialist Rehabilitation and Ambulatory Care Centre will anchor the Quarter. The redevelopment will retain five heritage buildings showcasing some of Brisbane's most important health architecture. This new piece of the city will invite human occupation through a generous public realm.

The presentation will outline the Herston Quarter Redevelopment using three distinct elements: an overview and comparison of the Australian and UK healthcare systems; introduction of the Herston Health Precinct with an overview of the last six years that have seen masterplanning, design and feasibility studies help shape the future for Brisbane's largest tertiary health precinct; and an examination of the key manoeuvres proposed for the precinct that will define its future.

The precinct masterplan, public realm and architectural strategy will be presented to illustrate how the precinct will evolve over the next ten years, with the Specialist Rehabilitation and Ambulatory Care Centre highlighted as a case study.

New models of healthcare planning, design and architecture: how Markham Stouffville Hospital was transformed into an integrated wellness community

The Markham Stouffville Hospital (MSH) development demonstrates how a 20-year-old, formerly isolated facility can be transformed into a healing and wellness hub for the city of Markham, Canada.

Built in a suburban development in the early 1990s, the original MSH was set far back from roads and was isolated from pedestrians and neighbourhood activity. In recent years, the area has become more urban and densely populated. The vision contained in a new masterplan for the hospital and its large landholdings was to create a true wellness community – one that would capitalise on land transfers from the municipality to surround the hospital and its expansion with a library, a large community centre with a swimming pool, additional medical office buildings, and an ambulance station. The redeveloped MSH would also be adjacent to a long-term care facility, a residence for severely disabled adults, and a district energy plant.

The completed redevelopment features an innovative and remarkably efficient co-location of programme space. With a direct indoor bridge to the community centre and library, the hospital is now a public hub for promoting wellness through outreach programmes. MSH uses the community centre's gyms and pool for therapy, and the community library houses the medical library. A strong circulation spine links the new wing, the existing hospital, and the community centre. The new hospital wing aligns with the new orthogonal, urban street grid and allows for both expansion and regeneration over a 100-year life cycle.

The hospital and other facilities all have access to a wellness green (public parkland). MSH has become the heart of this area's growth and intensification, and a model of a community's approach to health and wellness. Renovations to the existing facility have optimised care station functionality, and the design strengthens connections to nature.

Through analysis of the research and design principles used to inform the patient- and community-centric design of MSH, this paper will demonstrate how a dated healthcare facility was transformed into a modern, integrated wellness community.



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Using bus passes to create personal data stores to streamline health and care services

This paper describes a tested innovative approach to data-sharing between health and care organisations, which could be implemented quickly using existing user-friendly technology to support system change.

Local authorities issue bus passes to 12.5 million older people, using the same software and near-field communications (NFC), a secure technology also used for other travel cards and smart phones. A small amount of unused memory capacity on bus-pass chips could be modified using GIS software to create a small, integrated person-centric data store.

As the card owner adds the data, privacy issues in sharing information become redundant. With appropriate permission, the data-store information can be shared across health, housing, voluntary and social care sectors. The idea has been tested and formally evaluated by Anglia Ruskin University with positive outcomes.

The range of information that can be stored includes:

1. Personal: eg address; telephone number; date of birth; next of kin; partner; ethnicity; leisure interests; etc.
2. Health and wellbeing: eg details of GP and other professionals; medications; conditions; advanced care plan; dates of hospital visits; etc.
3. Circumstances: eg type of housing; dependants at home; supporting neighbours and friends; financial position; etc.
4. Pursues about activities: eg journeys by public transport; volunteer hours; etc.
5. Voluntary activities: type offered; skills offered; etc.

With appropriate permissions, this shared information can be used by the person, and by the services they use, in three main ways: emergency services will have access to key information about a person in event of their collapse or an accident; organisations can use joined-up information to improve the responsiveness and co-ordination of services; and joined-up information will enable services to be streamlined, reducing overhead costs and duplication.

The Isle of Wight is exploring how people's use of bus-pass personal data stores could be scaled across the UK to support transformational system change and how benefits can be quantified more precisely.

Living with dementia: the role of music therapy and approaches to reduce social isolation and behavioural challenges

People with dementia have deteriorating functioning and cognitive impairment, which lead to a variety of behavioural problems: irritability, depression, anxiety, paranoia, aggression, wandering, pacing, agitation and sleep problems.

One of the main challenges for people living with dementia and their carers are issues of social isolation, which can manifest from a lack of communication between the carer and the person with dementia. For people living with dementia, the most common challenge is described as “sundown hours agitation” – thought to be associated with impaired circadian rhythmicity, environmental and social factors, as well as weakened cognition.

Creative activities and the arts, however, can play a crucial role in easing the behavioural challenges associated with dementia anxiety. This paper will report on a structured music therapy programme, developed on behalf of a not-for-profit Australian radio broadcaster. Called Silver Memories, the programme targets dementia patients with outstanding results. The brief was to develop a commercial model that would allow the programme, successfully evaluated in Queensland, go national, taking account of the different policies and funding structures for aged care in each Australian state.

The Silver Memories programme has been independently researched by Queensland University. The results were found to correlate with similar studies elsewhere in the world, notably in Denmark. Targeted music therapy not only helps relax people living with dementia but also reduces social isolation and agitation, as well as assisting in the engagement of dialogue that helps create access to memory. In addition to qualitative gains, financial savings were identified in staffing and drug use.

Results of the brain research into music therapy highlighted the same neurological patterns as are seen in people who practice meditation, suggestive of the calming effect of music and reduction of stressors.

Implications for design of aged care and dementia units will be identified in relation to the importance of the sensory environment to enable engagement in nostalgia and reminiscences.



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Extra care for older people – settings that value relationships

This research set out to explore the contribution that relationships, and the behaviours that underpin such relationships, have on the overall experience and outcomes for people taking up residence in a new-build extra-care setting. It was conducted through a partnership between Whole Systems Partnership, a strategic consultancy group in healthcare, and the University of Leeds' School of Healthcare Studies.

The research was conducted in several stages. First, it reviewed the literature to identify examples where good outcomes had been achieved through a focus on a set of values or behaviours that reflect the quality of relationships in care settings for older people. Statements from this research were derived and explored with residents, staff and the wider community to arrive at a view about what was important to residents. The statements were also organised into what we have described as the attributes of relational value, namely integrity, respect, fairness, compassion and trust.

Having established what was important to residents, the team developed a questionnaire that could be used to capture the extent to which the behaviours consistent with good relationships were present in the care setting. Different 'domains' were built into this survey tool, covering people, culture, vision, process, infrastructure and technology. We believe the results from this demonstrate good levels of quality relationships.

This work was undertaken at the same time as a more traditional quantitative evaluation was carried out. Real benefits against a control group of people with similar levels of need were evidenced alongside the positive outcomes from the relational survey. This research is now being followed up in other locations, where benchmarks of good quality, relational care can be established. It's hoped that the ongoing research will identify a positive correlation between good relational care and positive health outcomes. Lessons for design in healthcare can be derived from the approach and associated survey tool through its roots in systems thinking.

Clinic 20XX: understanding consumers, continuums and change-readiness

In 2015, research was undertaken to understand how outpatient care – in particular, primary care – was transforming in the United States. Researchers identified five drivers: a changing health system; an ageing population with consumer-based demands; challenges in physician availability; transformation in team structure; and advances in data, technology and medicine.

They observed five trends: telehealth; mobile health; coordinated care; retail health; and population health. They then considered three clinics but failed to reach a consensus on what clinic features were “change-ready”. The team also conducted a poll of patients visiting primary care clinics in two age cohorts – 300 millennials and boomers – and a poll of 100 internal and family medicine physicians. A few insights emerged:

- patients want a better experience but don't want to think of themselves as consumers;
- physicians are over-burdened with documentation but would like more quality time with patients;
- cleanliness, cost and convenience are key factors driving patient choice of where to receive care;
- telehealth must address trust, connectivity and privacy; and
- co-ordinated care and population health are perceived as more sustainable trends than retail health.

From a facilities perspective, the team found:

- cleanliness/hygiene were the top concern across all age groups;
- on-site diagnostics were a top-three concern for boomers, while distance from home was more important for millennials;
- spa-like ambience was a top-five concern for millennials but not a priority for boomers; and
- acoustic and aesthetic considerations vary across age cohorts, but acoustics took precedence over visual appeal.

This presentation will explore these findings, and more, from a UK perspective, with results shared from a UK poll of patients. Concepts of designing for an ever-changing present – or 20XX – will also be outlined, with case examples that illustrate three key principles:

- every facility will have a cloud-print and a footprint;
- spaces will not be defined by walls alone; and
- flexibility, connectivity and a sense of place are tenets that can withstand the sands of change.



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XXS-H Kiosk design research into the smallest bit of institutional healthcare in Singapore

Expanding needs, limited human and material resources, and a changing social and cultural context are challenging the organisational pyramid of healthcare institutions in Singapore. The rising educational and economic standards of the population and their care expectations in old age are in conflict with the potential of the current system to provide for these. Secondary and tertiary institutions are foreseeing transformations owing to declining average stays of inpatients, burdening primary care facilities further.

Transformation of the organisational pyramid needs to extend beyond spreading horizontally within the current strata, particularly the primary care facilities network. We propose to explore the possibility of vertical breakdown to the smallest institutional bit – the H (health) Kiosk.

We claim that the reach of all three levels of healthcare (primary, secondary, tertiary) could be extended and impact these extra-small units, punctuating into the very core of urban anatomy – housing. H Kiosk would be connected to higher-ranking institutions and provide basic treatment, care services, therapies, and counselling.

We explore:

- the inversely proportional relationship of size and reach of H Kiosk as the smallest healthcare bit;
- the impact of the connected care model, application of digital technologies, and their impact on design and community involvement; and
- the design and placing of smart and sustainable H Kiosks in response to needs, and engagement of societal resources in their operations.

Method: The methods applied range from preliminary programmatic, literature and digital technology surveys to on-site investigations in three social housing estates.

Results: These small, smart, sensitive and sustainable healthcare units are beneficial on multiple levels – social capital; fiscal and ecological sustainability; ageing care; urban resilience and revitalisation; inter-generation connectivity, etc. Thus, the initial problem regarding efficiency, reach, capacities and typologies of spaces for care could be solved not by increasing numbers and resources but by reducing the size of the basic care unit, equipped with digital tools embedded in design, while, at the same time, extending its reach through diversifying the scope of care, strategic urban placement, and engaging with societal resources.

European Healthcare Design Awards 2017

The European Healthcare Design Awards 2017 aim to have a significant influence on the creation of environments that promote health and wellbeing, embed quality improvement, and support the delivery of treatment and care in an accessible, economic and equitable way.

Organised by Architects for Health and SALUS Global Knowledge Exchange, the awards are an integral feature of the Congress and contribute towards the development of knowledge and standards in the design of healthcare environments around the world.

Comprising ten categories across primary, community, secondary and tertiary levels of international healthcare provision and delivery, the awards will be presented at an illustrious ceremony during the final session of the Congress, followed by a celebratory garden party in the medicinal gardens of the Royal College of Physicians.

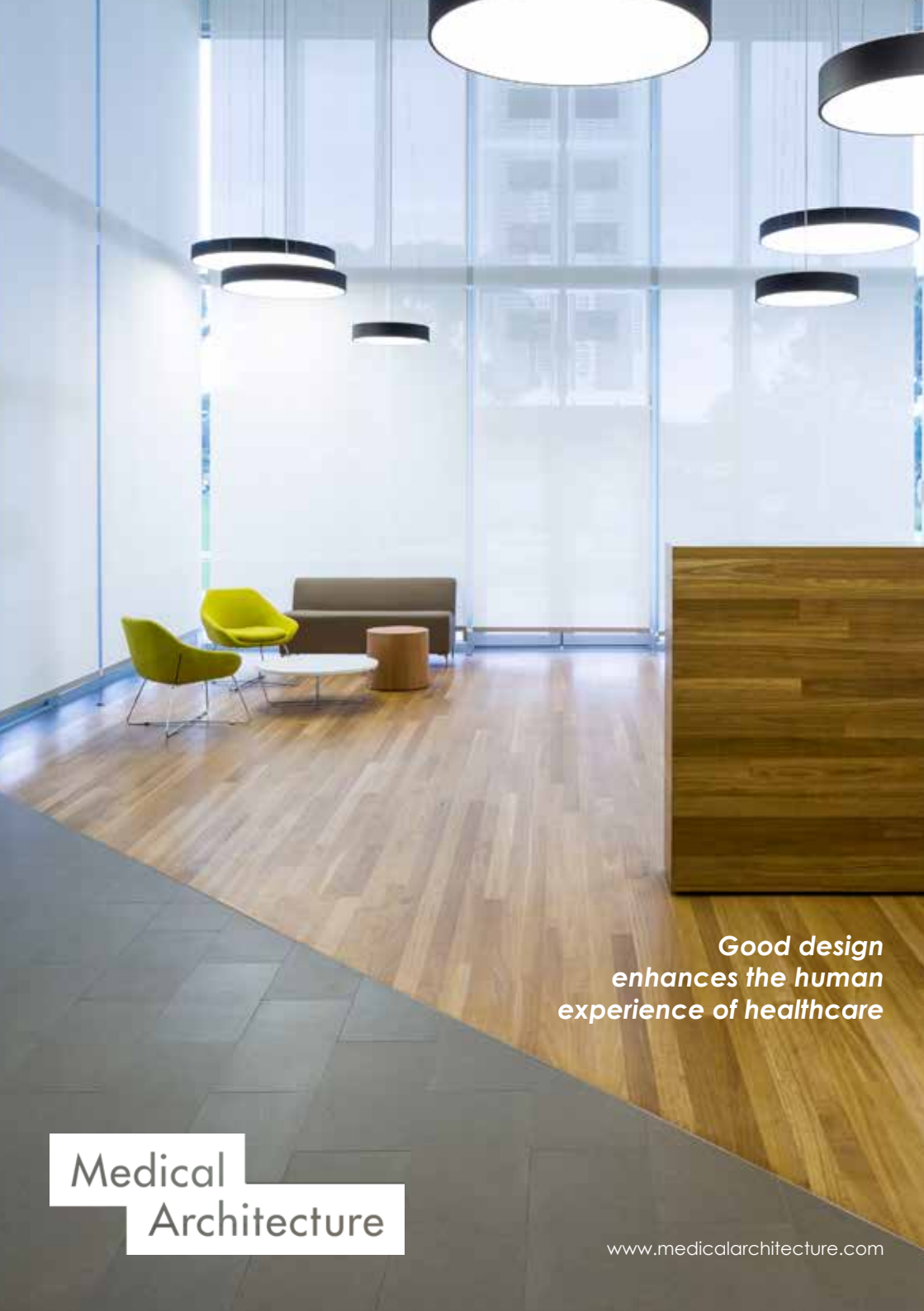
Recipients of the awards will be multidisciplinary project teams demonstrating outstanding vision, leadership and knowledge in the design, development and implementation of projects that have positively transformed the delivery and experience of healthcare for the patients and community they serve.

The awards evaluation committee features international researchers, practitioners and policy advisors, who bring specialist multidisciplinary expertise to the specific categories they have been invited to judge.

The shortlist and winner of each award are determined by a category chair, supported by two other judges with proven expertise in their field. This robust evaluation methodology ensures a balanced and transparent decision-making process.

The organisers would like to thank Awards lead sponsor Integrated Health Projects (IHP). A fully integrated joint venture, IHP combines the stability, capacity, coverage and experience of Vinci Construction UK and Sir Robert McAlpine. Thanks also go out to Category sponsor Medical Architecture.

For full details, see p43-53.



*Good design
enhances the human
experience of healthcare*

Medical
Architecture

www.medicalarchitecture.com

Designing a very different hospital

A radical prospectus for hospital design is needed to explore new possibilities for both the design of hospitals and clinical management of patients.

Can we extend 100-per-cent single rooms to provide operational flexibility, where any bed can be used for any patient? Does the provision of a therapeutic environment meet the test of getting a good night's sleep? How can the provision of an intelligent assistive environment bring data accuracy and real-time meta-management of patients in hospital? How can we support clinicians to see how patients are progressing clinically, and feeling subjectively?

The proposal responds to several perceived weaknesses of hospital design: the difficulty of fitting patients into specialties and sub-specialties; the failure of information systems to work as well as we know they could; and the dominance of the 'industrial efficiency' paradigm.

First, the imperative to give each patient dignity and comfort opens up a new way of managing their clinical care both individually and collectively. A 'unified bed matrix' can effectively replace beds previously allocated to specific specialties.

Second, in their design, rooms must be both 'therapeutic' and 'intelligent' environments. The former is a well-established concept, while the latter refers to a technological grid encompassing the room that allows intelligence on what is happening within it to be registered through sensors. This technological infrastructure is critical to any new approach to bed management.

Third, a paradigm shift is required, such that beds are no longer associated with, or allocated to, specialties on a fixed basis. Daily and hourly shifts in the inpatient population determine the allocation of any patient to any bed. The traditional diagnosis and treatment plan remains unaffected but is distributed throughout the matrix rather than grouped in one location.

How do these ideas relate to current hospital design practice? The ambience and human impact of the building are judged by the collective daily experience of citizens and staff. Is it a marvellous building that is a joy to work in and does the building make you feel better, or does it accentuate how ill you are?



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Re-activate! Create an activating patient environment by creating a non-bed-centric environment

Staying in hospital has a strong negative influence on the body, which is aggravated when a patient undergoes major surgery. Fewer negative effects occur, however, when patients remain active during their hospital stay. Indeed, research shows that only 15 per cent of patients actually need to stay in bed.

In order to enable hospitals and patients to benefit from these insights, this presentation introduces Holland Health House (HHH) – a set of scientifically based practical interventions intended to bring about a total change in organisation and spatial design of hospitals.

HHH is a concept based on a completely different day schedule and design of the patient environment. The concept revolves around the notion of 'making patients stronger'. HHH programmes a rhythm of eight hours of activation, eight hours of relaxation, and eight hours of sleep. This requires an alternative mindset of patients and personnel, as the daily rhythm of a hospital stay needs to be interpreted differently, involving a different interpretation of space.

To tackle the problem at its roots, we change the care environment. Introduction of new and different spaces, and the incorporation of a different day schedule bring about activity and motion. The bed is solely reserved for sleeping; all other activities take place elsewhere. We soften the transition from bed to room, from room to corridor, from corridor to department, and from department to the rest of the hospital. These subtle transitions invite patients to move around and remain active.

HHH is a concept in progress at existing hospitals in Utrecht and Maastricht. In these different settings, there are different scales of innovation. In Utrecht, in collaboration with TNO, we're working on a new bed department with a new typology that requires a change of mindset within an existing building. In Maastricht, we intend to introduce significant changes at room level within the existing department, and measure and monitor the results.

Designing flexibility for the future through lean operational planning with the incorporation of technology and art

In 2010, University Health System (UHS) embarked on a project to transform the University Hospital with a state-of-the-art ten-storey tower. Central to the project were design for quality improvement, innovations in technology, and art for healing.

Methods: Lean was used as a guide for the simultaneous redesign of the facility and operations. Quality was defined broadly as improving health results, experience of care, and efficiency and value of care. The team defined metrics, integrating performance goals into key aspects of the project design and construction processes.

Innovation in technology and flexibility for future change were incorporated into the design, including tele-tracking dashboards, hands-free video conferencing, integrated operating room systems, and automated guided vehicles (AGVs).

UHS created the Salud-Arte: Art of Healing Program to curate art that inspired hope and healing. A "call for art" was issued through a designated website, and over three years, the art was chosen, created and installed.

Results: The project resulted in a new bed tower, and renovations and expansion of the existing facility. These designs focus on quality improvement, technological advancement, and art to improve patient care. Across the hospital, the design improved healthcare quality by combining an understanding of operations with facilities. In the emergency department, for example, there was a reduction in the number of patients leaving before the end of treatment while satisfaction scores also improved.

Tele-tracking boards on nursing units provide real-time updates on patient conditions. New integrated operating rooms allow hands-free video conferencing to consult with specialists or teach from the sterile field. And AGVs work behind the scenes to move supplies, trays and linens efficiently.

More than 1100 original works of art were assembled, providing healing and inspiring art for patients, families and the community.

Conclusions: Defining goals and metrics at the project outset allows for the integration of multiple design elements to work together in serving the patient and needs of the healthcare organisation.

We found this metric definition: provides overall structure; builds consensus; allows for clear evaluation of alternative designs; and improves outcomes.



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Critical care design – design competition winners and future trends

The objective of this study is to discover themes that correlate with therapeutic and supportive environments, as judged by physicians, nurses and architects. It will use the rich information available from the Society of Critical Care Medicine's (SCCM) annual design competition and perform a comparative data analysis, contributing to evidence-based data. This quantitative and graphic analysis describes architectural planning and trends in ICU designs from around the world.

Objectives: There are several learning objectives:

1. Exploring future trends in the design of these complex facilities;
2. Learning about the similarities and differences of winning designs;
3. Comparing designs from the United States to international winning entries; and
4. Obtaining valuable planning and design data for future design challenges.

Methods: All SCCM design competition entries include descriptive forms completed by the ICU submitting. This information provides background data for judges related to: design approach and concept; construction budgets; type(s) of patients; overall size of the units; and a small-scale floor plan of the unit. The ICU also provides a video wall-through with a voice-over description of the unit and the attributes that staff feel are important. The author has also toured a number of winning ICUs, interviewing staff and physicians, and photographing the units in operation.

Results: The design competition entry data, additional information collected through post-occupancy tours, and architectural plan analysis have yielded comparisons of past ICU winning designs. The findings compare: planning approach and concept; space programme components and areas; social organisation of the unit; architectural layout; configurations; and circulation patterns. They reflect changing attitudes to patient- and family-centred care and accommodations, and attitudes towards staff facilities in the ICU.

Conclusions: The SCCM design competition offers an exemplary collection of ICUs, judged by physicians and nurses who specialise in critical care medicine and by architects who specialise in health facility design. Data collected and analysed from these units offer great understanding of historical information on critical care design and offer a guide to possible future trends in this specialty.

Emergency talks – design for staff communication in emergency departments

Team communication is critical for collaborative care, contributing to staff and patient satisfaction, safety, and organisational effectiveness; conversely, miscommunication is a root cause in up to 80 per cent of medical errors. Emergency departments (EDs) are complex environments that require high levels of trust and fast transfer of information via informal exchanges.

Objective: This research partnership between an international architectural firm, university partners and the Australian Government aims to identify spatial designs that support effective informal communication within EDs.

Method: Research was conducted at four public hospital EDs in Melbourne, Australia:

- Stage 1: Literature review of the relationship between teamwork, communication and design;
- Stage 2: Social network survey of 103 ED staff to examine patterns of informal communications; and
- Stage 3: Focus group discussions with 39 staff, who took photos of locations where communication was enabled or inhibited.

Results: The literature review revealed the importance of communication for teamwork. Participants took photographs of five types of workspaces: centralised workstations; dedicated rooms; transit spaces; communal spaces; and patient spaces. Focus group discussions revealed three factors influencing informal communication: staff perceptions of privacy; safety; and connectedness to activity.

Conclusions: The research indicates design elements are contributing to tensions within EDs that can hinder team communication. EDs have a diversity of workspaces to meet functional needs but a lack of dedicated space for confidential conversations. Spatial transparency and staff situational awareness are important, but exposure and accessibility limit confidentiality. Staff are transforming existing areas into temporary workspaces that balance competing needs for privacy, connectedness and visibility.

Designs that enhance staff perceptions of safety and control are prioritised over aesthetics and physical comfort.

Implications: ED workspace designs need to: provide visibility and connectedness; support professional and personal conversations between staff; and optimise staff proximity without compromising safety. This research supports the inclusion of innovative adaptable spaces for informal exchanges that contribute to a safer, more effective workplace.



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Intensive care unit: work in progress

Over the past 10 years, we have completed five ICU renovations in the Hospital Clinic de Barcelona, a public hospital with a high commitment to research and innovation. This learning process has culminated in the renovation, currently under way, of a sixth ICU (Hepatic ICU), which aims to be a benchmark for a new ICU model.

In considering the demands of patients and medical staff, the project bases its design on the quality, safety and efficiency of spaces with a limited cost.

Internal distribution: The classic distribution has been changed to build new areas with more light and less noise for patients. New partition systems are studied to avoid the feeling of always being seen and increase patient privacy.

Lighting: Daylight has been integrated with the circadian cycle. A night light is located at the entrance for medical professionals, but does not upset the patient.

Module type: A piece of furniture has been designed, with access from the outside and the inside of the room to avoid overlapping or misplaced elements in walls. All electronic, technological, and computer data elements are integrated.

Art: Photographs are positioned at strategic points to create a relaxed atmosphere. They can be placed on walls as well as ceilings, to break the sequence of the ceiling plates and increase the sensation of verticality.

Materials: All materials are sustainable and 100-per-cent recyclable, helping create the optimal atmosphere for patients and staff. The project seeks to improve patient wellbeing through the professional space, transforming services through the design of areas and their elements.

Patients have a more pleasant, intimate and private space; they are able to control views and lighting, and have access to technology and entertainment on demand.

Professionals work in a pleasant atmosphere with lighting control, and elements for daily work are all centralised (module type).

Usability briefing for hospital architecture – exploring user needs and experiences to improve complex buildings

This PhD research contributes to an ongoing debate about improving the building design processes of complex buildings. It provides knowledge about capturing user needs and defines the process model for usability briefing for hospital architecture from a user perspective.

Methodology: The PhD thesis is based on comprehensive literature studies, three main case studies at hospitals, numerous expert interviews, and workshops.

Results and conclusions: The PhD research results generate a better understanding of how knowledge about user needs can be fed into briefing and design processes.

Understanding usability – a concept that depends on subjective view of users, context, culture, situation and experience – is achieved by involving users. Briefing, also called architectural programming, is usually one of the first phases of a building project. Led by experts, the process involves users as data sources, and results in a programme of requirements for the building.

This thesis proposes a usability briefing process model, where briefing is a dynamic and continuous process throughout all building phases. In the proposed model, the activities of briefing and design are not sharply divided but support each other in frequent interactions. User involvement and evaluations support briefing and design by common learning, participatory data collection, and analysis of needs. Therefore, the model combines all interrelated activities and provides a visual overview of them throughout all phases.

This thesis suggests that the practice of user involvement could go further, proposing a move towards user-driven innovation and Scandinavian participatory design, where users are seen as partners and co-creators. The model incorporates evaluation activities into the process at an early stage so that these can give input to briefing and design, and can occur as participatory methods, eg simulations. To choose an appropriate method, the various methods and tools for evaluating facilities are grouped according to their focus: technical building performance; function/usability; or form/beauty.

Implications: The results are published in five scientific articles and summarised in a thesis. The results have relevance for researchers, architects, facility managers and client organisations planning new complex facilities.



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Service users' involvement in the planning of a new psychiatric hospital: an example of a user-focused planning process

The Hospital District of South Ostrobothnia, Finland has launched a process for planning a new psychiatric hospital. The new building will bring together, under one roof, inpatient care and outpatient units now situated across the town of Seinäjoki. Involving staff and service users has been one of the leading principles in planning the hospital. Both groups have experiential knowledge, and with user-focused planning, it's possible to design facilities that best serve the core functions. The planning process also supports operational improvement towards a recovery-orientated model of care.

Methods: Service users were involved in the planning of the new hospital from the outset. First, a pre-evaluation of current facilities and functions was made by both service users and staff. Second, a group of service users formed a working group contributing at each stage of the planning process. We also asked patients using adolescent mental health services for their views on how the wards should look, as views of this group differ from their adult counterparts and are often underestimated.

Results: The ideas of service users are compatible with studies of evidence-based design research. Single rooms with an ensuite support privacy. Small wards promote person-centred care and a feeling of safety. The facilities and environment should enable carers to be involved in the care of their family member while in hospital.

Peer support is a key element of recovery, and the new building offers several types of room in which peer-support and professionally led groups can gather. Near the main entrance, there are information desks for both service-user and carer organisations. On the same level, there is also a library and cafeteria for all.

Through this openness, we hope to reduce the stigma sometimes still associated with mental health problems.

Conclusions: Co-designing with service users has contributed new, patient-centred aspects and ideas to the planning process. Planning a psychiatric hospital for the recovery of patients wouldn't be possible without collaboration and service-user involvement.

Healthcare evolves from sustainability to wellness

How are healthcare systems embracing LEED and other tools for measuring sustainability? This paper hypothesises that around the world, users are moving beyond using measuring tools to determine if they're achieving sustainability goals towards a more holistic definition of sustainability that incorporates the concept of wellness.

Users are embracing sustainability in their everyday lives and operations as critical to quality improvement in service delivery and the patient experience, as well as creating financial efficiencies. This is now driving new ideas and process improvements to support 'wellness' in healthcare environments, which, in turn, creates higher productivity and improves the morale of staff, visitors, patients and the local community.

Outcomes: Sustainability has been classically interpreted as improving efficiencies, such as energy for lower carbon footprints, better material selection, and reduced water use.

However, sustainability concepts and design processes at hospitals such as Dell Children's (LEED Platinum), Birmingham Children's (LEED Gold) and THR Flower Mound (LEED Silver) have led to greater recognition among US healthcare systems of the economic and employee 'payback' of applying sustainability to other systems. These healthcare organisations understand that the tools that have been applied to other daily operational processes could dramatically improve: the efficiency of healthcare workers, thus lowering the overall cost of healthcare; and the application of the 'well' concept, not just for the hospital but also the community around the hospital, to develop civic pride and confidence in their built environment.

Implications: This paper will demonstrate how these healthcare systems are improving their operational models and reveal some preliminary results in areas of:

- integration of building systems to improve staff efficiencies and the patient experience;
- integration of medical support system platforms to help healthcare workers shave vital minutes off tasks to allow more time for one-on-one patient care;
- revision of the entire patient experience model through use of smart technology to save the patient time, remove some of the anxiety from the healthcare experience, and improve outcomes; and
- redefining community outreach programmes through technology to promote healthy lifestyles and a 'well' environment.



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Healthy planet. Healthy people: building a global knowledge community to improve planetary health

Planetary health is a new, multidisciplinary approach to health and wellbeing, which brings together scientific knowledge of both human and ecosystem health with new thinking about “human systems and the political, economic, social, technical and environmental [influences] on the policies and institutions we create that shape the decisions and actions of our planet’s natural system”¹.

The scientific case for a planetary health approach was established in a July 2015 report in *The Lancet*, ‘Safeguarding human health in the Anthropocene epoch’, in which the Rockefeller Foundation-Lancet Commission on planetary health detailed how the degradation of natural systems harms the health of individuals and communities around the world. Defining planetary health as “the health of human civilisation and the state of the natural systems on which it depends”, the Commission’s report argues that despite the emergence of the discipline of ‘global health’, which explores the interdependence of individuals and populations, planetary health offers an even broader understanding of the risks to human civilisation and future generations by adopting a whole-planet view of human health and wellbeing.

This presentation will explore how SALUS Global Knowledge Exchange is building a global knowledge community to support the advancement of research, education and policy around the concept of planetary health and design, and its translation into practice.

The Exchange uses social media technology to create a dedicated digital platform for the exchange of knowledge on improving human and planetary health. Featuring all the videos of the talks and full written research papers from the annual European Healthcare Design Congress (www.europeanhealthcaredesign.eu), and the new Healthy City Design International Congress (healthcitydesign2017.salus.global), the platform aims to:

- build a global interdisciplinary knowledge hub and community;
- empower collaboration between researchers, policymakers and practitioners;
- promote the interface of science, art, culture and innovation;
- showcase global expertise in the field of human and planetary health;
- build knowledge and skills capacity through education and training;
- create an innovative environment for global market development;
- build a digital archive of research, built projects and innovations.

1. Richard Horton; Robert Garri. Planetary Health: Improving wellbeing, protecting ecosystems, and sustaining human civilisations. *Economist*, 2014.

Healthcare facilities at disaster and rescue zones: characteristics and future developments

Natural disasters appear to be growing in number and intensity, owing to global warming, population growth, increased travel, and overcrowding of cities, while man-made disasters, including wars, terror attacks and chemical plant explosions, do not seem to be diminishing. National and international bodies, non-governmental, military and commercial organisations, and even private donors enlist to provide humanitarian and medical support, and send supplies, shelters and temporary healthcare facilities to disaster zones, where fast response is needed.

The aim of this presentation is to review types and structures of healthcare facilities currently available for rescue and salvage sites, to compare their relative strengths and weaknesses, and to suggest future directions. Permanent structures and temporary facilities are the two main categories of healthcare facilities functioning at disaster zones.

Permanent hospitals are independent functioning medical units that are moved or transported to and from disaster zones as complete units, based on need. They can be floating hospitals, flying (airborne) hospitals or terrestrial mobile facilities. They are thus self-powered and contain mobility aids within their structure; they use water, air or land as a transporting media.

Temporary healthcare facilities are transported to disaster zones as separate non-functioning elements, constructed or assembled on site, and subsequently taken apart. They include the classical soft-type tents and solid containers, which are organised as hospitals in camp configurations.

This presentation will discuss the strengths and weaknesses of the various hospital options, depending on route accessibility, climate, distance, location, infrastructure, security, topography, type of disaster, urgency of relief, and population characteristics. Portable hospitals for disaster zones are a challenging and exciting field for architects. Using novel building technologies, exploring advanced materials, and studying fresh shapes and structures, this is an opportunity to develop an innovative and exciting 'portable architecture', and to offer directions in research and enterprise for dynamic and modular hospital architecture.



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Singapore's Khoo Teck Puat Hospital: biophilic design in action

Biophilia is described as an innate human attraction to nature, a need to affiliate with life and life-like processes. Biophilic principles in design refer to the attributes of an environment that speak to biophilic desire in users.

This paper makes a case for biophilic design in healthcare based on findings from a post-occupancy evaluation (POE) of Singapore's Khoo Teck Puat Hospital (KTPH).

KTPH – one of eight public hospitals in Singapore – opened in 2010. From the project's early inception, its project team set out to examine how architecture and its elements might positively impact the wellbeing of occupants and visitors. This was elaborated as five principles:

- 1) Sight – visual access to greenery and water in gardens that appear rainforest-like;
- 2) Smell – selection of scented plants;
- 3) Sound – of falling water;
- 4) Variety – selection of plants that attract birds, butterflies, insects;
- 5) Community – seats, walkways and promenades near or within blue-green elements.

The winning design scheme organised the building around a landscaped court, which extends above and below ground, creating an impression of a building emerging from a garden. A desire to extend the hospital's public space towards an adjacent storm-water pond – outside the hospital's boundaries – led to inter-agency collaboration to upgrade the water body into a pocket park and link it back to the hospital court.

As the project progressed, other areas of public engagement became important: a community farm on the roof was added; public spaces and amenities were expanded to attract visitors from a nearby housing estate; and events were organised to attract visitors from further afield.

The POE looks at how natural elements – water, greenery, biodiversity – affect user perception, and how these perceptions affect preferences and wellbeing. There is evidence that patients, staff and visitors prefer Khoo Teck Puat Hospital over other hospitals because of its design, and this is linked to perceived naturalness of its landscape.

KTPH has affected the way hospitals are seen in and outside Singapore, with the country's most recent public hospital, Ng Teng Fong Hospital, borrowing much from its predecessor.

Healthcare design: an extension of the natural and built environment

The healthcare industry is increasingly adopting integrated care systems in which building design plays a significant role in patient experiences, treatment and wellbeing. People-centred building design builds on several decades of research that demonstrate how certain environments stimulate behavioural, physiological and neurological changes in people conducive to healing and general wellbeing. Importantly, these design considerations for health and wellbeing are typically well aligned with concurrent efforts to improve the sustainability of healthcare facilities.

This paper explores the design of healing gardens in hospitals and how they can moderate stress and anxiety during potentially traumatic periods. There are few examples of rigorously researched and evaluated healing gardens shown to contribute to patient experiences and wellbeing. There is a particular need for insight into landscape design that extends the aesthetics and functionality of contemporary hospital design, and attends to the contextualised experience of patients, families and staff. Within this emerging field, there is a need to bring together research and industry to develop evidence-based, integrated design solutions.

The recently opened Lady Cilento Children's Hospital (LCCH) in Brisbane, Australia incorporates 11 healing gardens, the design of which drew extensively on research findings on the therapeutic and sustainability properties of integrated gardens. The LCCH building itself was designed to maximise natural light and enable intuitive wayfinding, as means of creating normalcy for patients, and reducing stress and confusion.

Preliminary evaluation of the LCCH healing gardens provides evidence of how these spaces create a vital sense of 'being away' from the hospital, and reduce stress and anxiety. Monitoring and evaluation of the environmental performance of the gardens provide data on water capture and reuse for irrigation, and temperature regulation through micro-climatic conditions.

While further investigations will yield additional insights, these preliminary investigations provide much-needed evidence of design considerations for healing gardens that contribute to their ability to improve patient experiences and wellbeing, as well as the sustainability of these spaces. The findings have the potential to influence practice and partnering with academia to inform design of healing gardens.



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Healthy living and 'bio-façades'

On average, we spend nearly three-quarters of our day inhabiting buildings, so it's unsurprising that the environmental quality of these spaces directly influences our physiology and feeling of wellness.

Biological skins of living organisms have evolved over billions of years, adapting to specific environmental contexts. Homeostasis – the maintenance of a natural balance of the body's internal environment – is key to our ability to adapt and survive. For human civilisation, a key function of architecture is to facilitate this natural equilibrium as an adjunct to our physiology, providing energy-efficient comfortable environments for different activities.

Sustainable design features aim to help buildings adapt to the changing environment, but they're traditionally static structures. This presentation will investigate the emerging thinking around biomimicry-inspired design, learning from nature's homeostatic adaptations to achieve healthier buildings. It will present research that re-imagines the building façade as a 'bio-façade', inspired by living skin, which constantly responds to its changing environment.

The presentation will define a research framework that drives innovation in façade design, moving towards the concept of a healthy building skin as an extension of the health of our bodies.

The presentation will interrogate three questions:

1. What are the aspects of human physiological wellbeing and how can buildings influence these?
Elements of architectural adaptation that can influence human health will be identified. Deriving inspiration for innovation in the design of bio-façades, four key principles – protect, nurture, adapt and regenerate – will be explored.
2. How do we quantify health and sustainability?
Existing methodologies for measuring the 'health' of the built environment will be reviewed, eg LEED, BREEAM, WELL Building Standard, etc.
3. How do we apply biomimicry-inspired innovation in healthcare architecture? Case studies of nature-inspired examples of adaptive architectural design in, or relevant to, healthcare buildings will be presented, including: Solar Leaf Bioreactor, Germany; Bio-skin, Japan; and Homeostatic façades, USA.

Finally, opportunities to rethink building façades that support and enhance human health and ecosystems will be considered in light of the question: how can we design future building façades to create a healthy environment by 2030?

Leadership from above and below – panel discussion

Human and environmental health are profoundly affected by the way we design, plan, construct and operate our buildings and activities.

Leaders in healthcare should consider the environmental determinants of health in every aspect of their operations, setting out a vision for the regenerative design of healthcare services and environments that: nurture instead of harm; replenish resources rather than consume them; enhance biodiversity; promote habitat restoration; and mitigate climate change.

By incorporating the triple bottom line of economic, social and environmental impacts, healthcare leaders can empower their staff, patients, visitors and local communities to be activists for the environment and, at the same time, enhance their own health, wellbeing and quality of life.



Chair: Dr Liz Paslawsky
(Australia)

International health
business consultant
Liz Paslawsky & Associates



Sumita Singha BArch
(Hons), RIBA (UK)

Non-executive director
Moorfields Eye Hospital
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Tricia Down (UK)

Head of health and
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Jenny Isherwood (UK)

National Medical Director's
Clinical Fellow
Royal College of Physicians



PICTURED: Ansen Seale's *You Activate this Space* in the new Sky Tower at University Hospital, San Antonio, Texas. Reflecting on the importance of their contributions, 42 LED panels change color as healthcare staff travel to and from work.

ENRICHING HEALTH + HUMAN EXPERIENCE

An interdisciplinary, research-based architecture and design firm, **Perkins+Will** shapes many global and progressive academic medical centres, research institutions, hospitals and health districts. Our **Human Experience Lab** proudly supports **Clinicians for Design**, an international network of leaders collaborating to enrich health and the human experience by providing a platform that engages clinical professionals, educators, and researchers.

Clinicians for Design cordially invites clinicians to contact us with their interest in the invitation-only morning session and the afternoon expert presentations and panel discussions organised by the **European Healthcare Design Congress**. Hosted at the Royal College of Physicians in London on **13 June 2017**, discussions will consider systems and innovations at the interface of healthcare and design.

Contact us at info@CliniciansforDesign.com or the **European Healthcare Design Congress**.

Clinicians for Design was co-founded by
Drs. Diana Anderson, MD, & Eve Edelstein, PhD, F-AAA



Clinicians for Design: leading change to radically enhance the quality of healthcare

Healthcare is undergoing a period of massive change, shifting towards a human-technology interface, and adopting innovations that interweave with human-centred design. The motives are numerous, including: increasing patient age; frailty; fragmented care; chronic illnesses; and the desire to enhance the quality of care.

Purpose: Our vision for the future of healthcare is still undetermined. What will the role of the clinician become as technologies shift decision-making away from human operators? Where will care ideally occur? How and where should care be provided for patients with increasingly complex conditions? How can design prevent and provide for independent living and rehabilitation relating to such conditions?

Methods: A think tank for the future of healthcare has been created to combine ideas about healthcare trends that overlap with design thinking, differentiated by the perspective of those with hands-on experience and responsibilities for care provision. Clinicians for Design harnesses the expertise and enthusiasm of clinicians and clinical scientists to address system redesign at the crossroads of this radical approach to healthcare.

Results: Our expert panel of clinicians will combine practice and research-based strategies, including:

- 1) The role of systematic analyses applied to care processes to address quality improvement. Case examples will report on medical planning and design strategies for neurological patients to enhance their own journeys and their providers' efficacy.
- 2) The changing role of the provider in the context of technological changes may reinforce strong clinician-patient relationships. Case studies will review how emerging innovations may inform future design.
- 3) System redesign may address hospital and community-based care delivery systems. Project examples will detail work to launch new standards for active and healthful living.

Implications: The themes of quality improvement, changing technologies, and distributed remote care are explored at various scales. Why clinicians should become advocates for design, what this convergence of disciplines can yield as a motivator for change, and how the fields of design and health can apply science and technology will inform how we envision the future of healthcare through our clinical roles and communities.



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Clinicians for Design Working Group

Clinicians for Design is an international network with a vision to enrich the healthcare experience. Its mission is to provide a cross-disciplinary platform that engages leaders with expertise in clinical practice, education and research.

In order to enhance health and care environments, Clinicians for Design's goal is to translate innovative technologies, research and systems into design guidelines and policies. Through collaboration with professionals and institutions, Clinicians for Design will develop curricula, peer-reviewed publications, presentations and consensus statements.

To facilitate the inaugural meeting, Clinicians for Design will be hosting an invitation-only morning workshop. The afternoon session features a series of expert presentations and panel discussions, which will be open to all registered congress delegates.

Collaborative working and leadership improves outcomes for frail older patients

Mid Yorkshire Hospitals NHS Trust has three hospital sites and is in the process of reconfiguring most of its acute services on to one site at Pinderfields Hospital, Wakefield. This development has influenced the creation of a Rapid Elderly Assessment Care Team (REACT) and plans to construct a dedicated older person's assessment or frailty unit. The implementation and redesign of services feature as one of the development sites for the Royal College of Physician's Future Hospital Programme, and forms part of the Wakefield approach to frailty management.

REACT is designed to facilitate much earlier hospital discharge for older people living in the Mid Yorkshire catchment area with acute illnesses and chronic conditions. The team is multidisciplinary and multi-agency in its make-up and benefits from collaborative working and leadership. REACT now assesses 25-per-cent more people on average (April-September comparison from 2015 to 2016). The average length of stay of REACT patients who are discharged directly from the acute assessment unit has reduced from 2.5 days to 1.95 days since developing a seven-day model. This has boosted team morale and helped improve staff engagement. The latter has been achieved through regular team meetings, dedicated workshops, and celebrating team successes.

Through collaborative working, the team has seen a shift in culture in spite of patient flow and workforce issues, which further reinforces the positive effects of working as a team rather than in silos. Indeed, in 2016, 92 per cent of team members were very satisfied with support from colleagues, and 63 per cent felt involved strongly in decision-making in developing the service.

Co-production through collaborative team working can make a positive change in patient experience and service redesign, especially in motivating staff while improving patient outcomes. This can be achieved using different techniques but, at its core, the team has a shared goal and every member's contribution is vital. In this way, teams can be supported to deliver safe, compassionate care and demonstrate their commitment to improving quality.



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Towards a 'future hospital': facilitating new models of care through a collaborative built environment

This paper will review the development of a new model of emergency care at Worthing Hospital – one of four hospital sites selected for the Royal College of Physicians' Future Hospitals Programme.

The hospital's previous patient pathway suffered from a separate admission process for surgical and medical patients using distinct areas. Specialist clinical teams were separated out across the hospital in three areas: the acute medical unit; the surgical assessment unit; and the department of medicine for the elderly. This resulted in variations in waiting times and access to investigations, often culminating in patients being placed in inappropriate clinical environments with the potential for a reduced focus of care.

The new model of care creates a single co-located emergency floor incorporating 67 flexible-use beds and an ambulatory assessment area, organised to deliver more streamlined and efficient care. Likened to a 'Formula One pit stop', it's an exemplar scheme for standardising pathways and streamlining care, built around the needs of individual patients and enabled through a multidisciplinary, adaptable environment.

The RCP's Future Hospital Programme itself has described the emergency floor at Worthing hospital as "bringing to life the principle of bringing care to the patient".

Three years after completion, benchmarking by the Society for Acute Medicine shows that Worthing is one of only three hospitals in England to combine the three disciplines in one department, despite positive evidence that length of stay has shortened, the A&E four-hour target performance has improved, and more than 20 beds have been freed up by use of the emergency floor.

To help the wider adoption of this new model of care, more data-gathering and flow analytics are currently being undertaken and will demonstrate a strong evidence base. Trials will also have been carried out, where the model of care is applied with no physical alterations to departments, in order to see the effect.

Novel virtual clinic to enable safe hospital discharge and reduce outpatient appointments

This paper presents a quality improvement project using a virtual clinic for follow-up of outpatient investigations on discharge from hospital, where, traditionally, patients would have awaited results or been followed-up in an outpatient clinic. The project was conducted on a respiratory ward in a Royal College of Physicians' Future Hospitals development site.

The main driver for change was growing demand for outpatient appointments, leading to patients waiting an unacceptable length of time to be seen. This led to an increase in the number of outpatient investigations that GPs were asked to arrange or follow up. Investigations requested in discharge letters post-discharge were often either not carried out or there was no evidence they had been acted on.

Method: A spreadsheet was created to allow junior doctors to add details of patients and their tests when they were discharged. Registrars refer to the spreadsheet and use hospital systems to search for results of these investigations, which they then act on. Feedback highlighted difficulties with sorting information and concerns that details could be deleted by accident. An access database was developed to search for results due, and ensure that data remains in the database even once removed from the 'active' list.

Outcomes: Sixty-two patients have been added to the virtual clinic over four months. The most common investigations were: radiology (43 per cent) and bloods (23 per cent). Assuming all patients receiving outpatient radiological investigations would ordinarily have outpatient review, 13 outpatient appointments were saved, implying a cost saving of £1404 in four months.

Auditing showed the number of investigations conducted, and with evidence of review, improved from 10 per cent to 83 per cent. Further measures are needed to assess the impact on waiting times for investigation follow-up and satisfaction with the system.

Implications: This tool could be used in any ward, ensuring adequate follow-up of outpatient investigations, reducing burden on GPs, and reducing the cost of unnecessary follow-up. A more formalised computer programme accessible to all medical staff would also be helpful for cross-speciality referrals.



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Universal design: homes and healthcare buildings for an ageing population

Universal design promotes environmental compositions that can be accessed, understood and used by all people who contribute to social, economic and cultural life regardless of their age, size, ability or disability. But how can universal design help ageing people live at home and in their communities independently and safely for as long as possible?

Designing and constructing new healthcare buildings, homes, or making alterations to existing buildings that are in line with a universal-design, age-friendly approach supports the aim of facilitating people to live well for as long as possible in their communities, while accessing medical care more easily. This approach also supports family members and health professionals to sustain caring relationships, particularly if they are older people or have a disability themselves.

Purpose: When looking at the design of new homes and medical care buildings, engagement with key stakeholders, reflecting the diversity of occupants, providers and designers, must be carried out. In order to inspire the change in mindset needed to bring universally designed homes and future healthcare buildings into the mainstream, consumer-focused information will be needed to communicate design guidance and act as a catalyst for cultural change in new home design.

Methods: This colloquium will feature architecture, design, clinical gerontology and dementia research experts, who will address the Universal Design Homes for Ireland (UDHI) guidelines. The panel will discuss design-thinking for ageing, and detailed guidance for the application of universal design for dementia-friendly dwellings and communities.

Implications: Living or working in a universally designed home or healthcare building helps avoid the need for re-location or costly building retro-fit works as individual, family, staff or patient needs change over time. Integration of smart infrastructure and energy-efficient systems at the outset of the design avoids costly re-fits and benefits everyone in comfort, efficiency and quality of services. It's not about a 'one-size-fits-all' model – the universally designed home and work environment enable the widest possible number of people to participate at home, in society, and to live independently.

How the clinicians' role in the briefing process for planning buildings for health can be optimised to obtain the maximum value from their position

Project teams believe that medical staff are sufficiently consulted during the briefing process. However, medical staff report feeling marginalised and lacking the skills to contribute consistently. CABE acknowledges this problem, which remains under-researched.

Purpose: To establish what can be done to enable positive and authentic medical staff engagement in the design process, to help create built environments that promote improvement in the health of the population and better patient safety.

Methods: A literature review and online survey asking medical staff their views on the involvement of doctors in briefing for healthcare buildings, and their view of the importance of good design.

Results: Five main results were found:

1. Training, education and support for clinicians undertaking roles in the redevelopment of hospitals are required.
2. Aligning SPA (Supporting Professional Activity) for medical staff. By designating redevelopment work as an SPA work stream, time and effort from clinicians should be ensured.
3. Commitment to 3D modelling, virtual modelling and mock-ups of proposed building designs to assist visualisation, as clinicians are not expert in the interpretation of 2D architectural drawings. The design programme and budget need to be managed to ensure time and money are available.
4. Improving documentation and acknowledgement of stakeholder contributions. A transparent way of capturing (medical) stakeholder input must be developed. A clear audit trail, recording how stakeholder views have been incorporated in, or excluded from, the brief is important to build trust with clinicians.
5. Sharing knowledge gained from post-occupancy evaluation (POE) was identified as crucial, as without it there can be no industry-wide learning.

Conclusion: Medical staff identified the following as key factors in ensuring effective clinical contribution to better healthcare design: training; alignment of 'Supporting Professional Activity'; use of available technology; clearer audit trails of decision-making; explicit acknowledgement of contributions to briefing; and use of POE.



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A photograph of a modern building's interior courtyard. The space is enclosed by glass walls and a glass floor, allowing a view of a central courtyard with plants and a paved area. The architecture is contemporary, with clean lines and a mix of materials like glass, metal, and concrete. The lighting is bright, suggesting a sunny day.

ONE HUNDREDTM

Lunchtime Design Workshop Part I

12 June, Chamber Council

12.45–13.45

Know and engage your user: empathy and co-design in healthcare

True people-centred health begins with understanding and engaging end users – including patients, families and staff – throughout the design process, long before their participation in the system is possible. While healthcare professionals are experts in delivering great care, we must also give influence to the experiences of end users, and invite them to help create the future. Without their perspective, we make assumptions and risk failure.

Connecting with end users traditionally involves mining patient satisfaction surveys, but these only paint part of the picture. In addition to harnessing standard methods for gaining insights about the current experience, ethnography – a social sciences tool – can be used to immerse ourselves in the lives of patients and families, illuminating their deepest emotions and needs.

Building empathy and co-creating solutions require four key principles for success: question curiously; listen actively; design openly; and iterate rigorously. By adopting a stepped framework to learn how to build empathy, ideate and iterate, participants will gain insight into a fresh approach to designing people-centred health systems.



Organised by



Presenters



Caroline DeWick
Strategic innovation
designer, HDR, USA



Beth Zacherle
Strategic innovation
designer, HDR, USA



Joel Worthington
Design strategist,
HDR, USA



David Grandy
Managing director of
strategic innovation,
HDR, USA



We're here to help the NHS transform the estate so it's better for patients, better for staff and better for the public purse.

Don't miss our breakfast workshop, 13 June: *'How next-generation public private partnerships can unlock the power of the NHS transformation'.*

This breakfast workshop will outline CHP's plans* for a next-generation PPP model to support a fit-for-purpose NHS estate able to accommodate changing models of care.

*Subject to Department of Health approval



"This obesity clinic would not have been possible if it wasn't for this building."

Dr Hendow, CQC outstanding GP, Bransholme Health Centre

Organised by



Breakfast Workshop

13 June, Chamber Council

07.30–08.45

How next-generation public private partnerships can unlock the power of NHS transformation

This session will outline CHP's plans for a next-generation public private partnership (PPP) model that will deliver an NHS estate fit for purpose and able to accommodate changing models of care.

Our proposed model is locally driven, maximises utilisation of the existing estate, and proposes new build only where appropriate. It offers an end-to-end solution that has the right knowledge, skills and resources at every stage of planning and delivery.

Building on CHP's 16-year heritage of successful delivery of the NHS LIFT Programme, this new variant of the PPP model gives equity of access across the NHS at a time of considerable economic restraint.

This next-generation PPP will help the NHS ensure its estate is a lever for transformation, so that patients are treated and cared for in high-quality, fit-for-purpose and modern accommodation.

Presenter



Graham Spence

Commercial director,
Community Health
Partnerships, UK



“

KwickScreen provides a solution whereby you have a high quality substrate on which to print artwork or way finding and satisfies the rigors of a clinical environment as it can withstand deep cleaning.

”

*Liz O'Sullivan - Trust Arts Manager,
Guy's and St Thomas' NHS Foundation Trust*

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Lunchtime Design Workshop Part II

13 June, Chamber Council

12.45–13.45

Design thinking: creative approaches to tackling today's health challenges

The aims of this workshop are to illustrate the importance of design thinking in healthcare, and understand how user-centred design methodologies are applied in practice. The workshop will begin with an introduction to design in healthcare, using case studies to illustrate specific healthcare problems, and related design-thinking methodologies, evidence and solutions.

Delegates will participate in some short interactive sessions to introduce design thinking and its application in healthcare. These will include innovation exercises and provide useful information, tools and methods. The session will focus on people-centred design as a means of innovation, demonstrating its value from both creative and frontline healthcare perspectives. It will enhance delegates' understanding of stakeholders, users and 'lead users', and the value that design thinking can bring. It will also show how innovations can be relevant in the real world.

Presenters



Jonathan West

Research fellow, Helen Hamlyn Centre for Design, Royal College of Art, UK



Ed Matthews

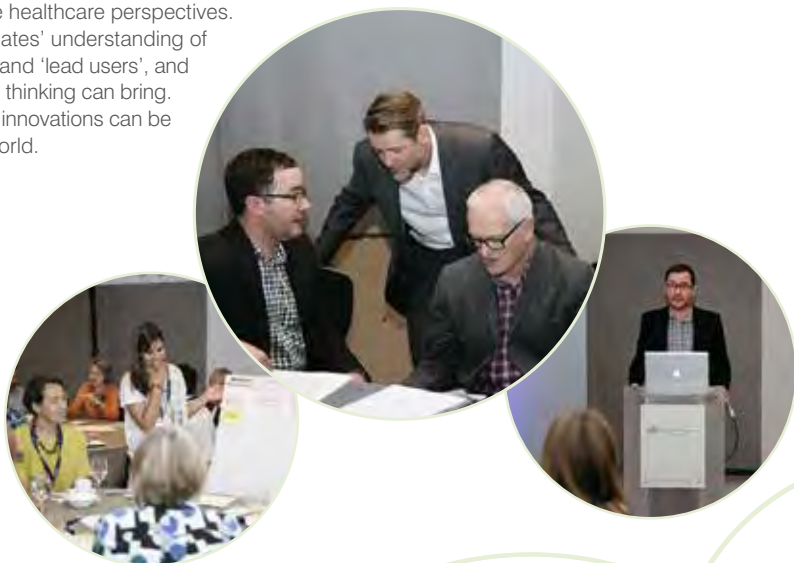
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Anders Haugaard

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P01 Can overhead hoisting technology ensure effectiveness and quality in care?

This paper explores how innovations in overhead hoisting technology can free up more time and optimise work processes with fewer 'hands'. These solutions have an impact at three levels: organisation, employee and patient.

The organisation will be more effective and give better opportunities for staff to use their time more efficiently. Complicated work processes can be undertaken with fewer staff members and reduce their risk of injury. Improved working conditions will also lead to a positive effect in retaining and recruiting qualified staff.

It's well known that in the healthcare sector, musculoskeletal injuries among staff members are frequent. By implementing the right solution, it is possible to reduce these injuries and prevent wear and tear over the long term, which will result in reduced sick leave. When an organisation has a high level of sick leave, it becomes ineffective and there is a risk of not being able to maintain quality in care.

Overhead hoisting technology can have a positive effect around the patient, too. Patients in hospitals spend up to 17 hours in bed, which can have severe health consequences. Overhead hoist technology can help mobilise patients very early and with a high level of safety. This can result in faster recovery and more satisfied patients.

Purpose: The purpose of this presentation is to show how overhead hoisting technology can help overcome some of the challenges hospitals are facing in finding time to care for patients.

Methods: The presentation includes an introduction to the theoretical framework, previous research, and evaluations on implementing overhead lifting technology.

Results: Results from studies and evaluation on implementations of overhead lifting technology will be presented.



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in architecture and health
design and research
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Kenneth Catchpole (USA)

Smart state endowed chair
in clinical practice and
human factors
Medical University
of South Carolina

David Allison FAIA, FACHA (USA)

Alumni distinguished professor
and director of graduate studies
in architecture and health
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P02 Using a systems approach to designing a safer and more ergonomic operating room

Adverse events, such as surgical site infections and surgical errors, are a huge problem in the operating room (OR), owing to the vulnerable state of the patient and the complex interactions between providers of different disciplines and equipment, technology and the physical space where care is provided. Clemson University and the Medical University of South Carolina have been awarded a four-year grant to develop a learning lab focused on patient safety in the OR. This learning lab, titled 'Realizing improved patient care through human-centered design in the OR (RIPCHD.OR)', involves architects, human-factors experts, industrial engineers, nurses and anaesthesiologists.

Purpose: The goal of this paper was to develop and describe a systems approach for observing and analysing the OR work system, leading to the development of design guidelines.

Methods: An in-depth literature review was conducted to develop a systems approach for studying the OR work system (people, tasks, technology, built environment, processes), which was then studied through analysis of videotapes of 35 surgeries in three departments: general, orthopaedic and paediatric. Three case studies were conducted to understand alternate approaches and best practice in OR system design. Finally, guidelines were created to help translate research findings into the design of a prototype OR.

Results: The systems approach yielded rich insights about: the tasks and activities of key stakeholders; the locations of people, objects and equipment; space needs during different phases of surgery; and the inter-dependencies and relationships between key players in the OR. Key areas of consideration include: the amount and location of storage to minimise door openings in the OR; relative location of zones to optimise flows; and the need to promote situational awareness among team members for optimal communication.

Implications: A systems framework provides a rigorous multi-dimensional approach for researching and designing a complex environment, such as an operating room. This is a more holistic approach to designing healthcare facilities that allows for a deep understanding of the complex interplay between people, tasks, processes, technology and the built environment.



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P03 CICU patient perspectives on healing environment (2006-2014): a qualitative exploratory study

The research explores the idea that space consists of many features that make up a composition that may go unnoticed, but it is there, waiting to be interpreted and experienced. This perspective is supplemented with another concept: spaces that surround us affect us; and how we're affected may directly or indirectly relate to the recovery process that follows a medical condition.

These two factors present us with a challenge: the task of rethinking a space and producing a new space where these architectural features are taken into consideration. The research subject is the patient; the space is the cardiac intensive care unit (CICU) room.

Objective: The primary purpose of this exploratory study was to describe architectural conditions that might assist in the CICU (cardiac intensive care units) patient's recovery process. We then sought to propose a new design paradigm for cardiac intensive care units' (CICUs) patient rooms.

Background: The design of CICU rooms has undergone significant changes over the last 10 years. However, there is a lack of information about the patient point of view in the design of these spaces. Therefore, rigorous exploration was needed to propose better CICU design plans that include the patient perspective.

Methods: Qualitative interviews were fielded using two questionnaires (n=86) in two periods (2006–2009; 2009–2011) by an interdisciplinary group of researchers.

Results: A new design paradigm for CICUs was developed, which, importantly, added the patient perspective. The paradigm consists of the following sets of architectural conditions:

- a) environment that stimulates the senses;
- b) optimisation of functional aspects;
- c) wellbeing of patients; and
- d) compliance with safety standards.

Conclusions: The new architectural CICU room design paradigm contains newly discovered environmental conditions indispensable for an optimal healing environment. Further research is needed to understand how the design paradigm may be implemented. Such new research should include the perspective of CICU family members and all related medical staff, in addition to CICU patients.



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P04 Architecture for maternity services: how design can take us from depersonalisation of the subject to a supportive environment

Birth, as a creative and complex act, is, even today, undervalued, somehow hidden, and subject to short-term efficiency or performance criteria. Maternity wards are still being designed based on the same obsolete guidelines and are therefore not focused on the needs of the individuals for whom they should be created: women, mothers and babies.

Our work analyses the way attention is given during birth to both mother and baby, as well as how pregnant and birthing women behave and relate to physical spaces. We also look at different theories and cultural approaches in relation to birth and its environment. Across Europe, birth rooms at maternity wards are still too often conceived as a reflection of our society: submissive spaces in a patriarchal system. Our aim is that neither feminist theories nor gender issues are excluded at maternity wards; rather, we would like them to pass through the entrance doors and become more prominent in providing a supportive setting.

Based on theories and through auditing indicators in realised projects, our proposal presents practical examples and solutions that reflect how applied evidenced-based design can reduce not only unnecessary but also harmful and expensive interventions in maternity wards. All result from a long-term learning process and teamwork with midwives, management directors, and other professionals related to maternity wards.

We would like to invite everybody to reflect on established design codes or guidelines we often forget to question when starting a design process. By dissecting those established codes, we can then approach a new understanding of how birth spaces can really support physiological needs during birthing and contribute to improved quality and health. Rediscovering the value of space will lead us to understand architecture as a driving force of change for hospital processes.



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P05 Enhancing the environment of paediatric oncology unit the Malaysian way: review, revive, recommend

Cancer cases are on the rise in Malaysia with their impact felt in almost every household – and children are not exempt. Upon a child's diagnosis, caregivers, including parents, have had to change their lifestyles abruptly, with some taking leave from work. Giving support and encouragement, they may need to frequent the hospital every other day as their child undergoes treatment. The hospital, in effect, becomes a 'second home'.

Malaysia is home to a multi-ethnicity and multi-religious population. Many turn to alternative medicine or resort to religious offerings for hope prior to admission. Owing to the age of facilities and lack of budget, current general hospital facilities for paediatric oncology units lack the spatial requirements to provide a compassionate care environment for both patients and their caregivers.

This research reviews the potential of existing oncology facilities in selected hospitals for children, with the intention of providing practical and affordable recommendations for their immediate enhancement. Adopting a qualitative and quantitative method, this research offers case studies for observation, interviews and a sample for recommended enhancement of the selected paediatric oncology unit in Malaysia.

Analysis of the case studies and literature review provide constructive findings of the needs and demands of designs required in the respective oncology unit – ie the clinic, the ward and the treatment rooms of the selected hospitals. Through sketches of proposed enhancement and discussion with the users – patient, caregivers and staff – the most appropriate designs were selected. These designs are preliminary outcomes of this research, and they are subject to approval by the respective management teams of hospitals in relation to implementation and request for funds.



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P06 Space quality in hospital architecture: explorative study and typology analysis of European university hospitals

Research and teaching hospitals are some of the most challenging cases in architectural complexity. They represent a relevant example of mixed-use buildings, with myriad users and multiple and overlapping structural layers: functional, technological, social and medical.

Objectives: University hospitals represent an interesting opportunity to investigate complexity and space quality in architecture. The environment can play a key role in supporting the therapeutic process and can offer positive stimuli to medical staff and researchers in their workspace. This study aims to explore recent European facilities, analysing how different architectural typologies and innovative technological solutions may help deliver space quality. Different groups of users, with different environmental requirements, co-exist in the same complex and high-tech building.

Methods: The study starts with a review of architecture theory, environmental psychology and research-based hospital design literature. It then defines the theoretical hypothesis and analytical criteria necessary to conduct a critical review. The case studies are recent European medical research facilities with different typological settings. The (ongoing) explorative study, through study visits, interviews, diagrams and tri-dimensional models, investigates architectural solutions in relation to space quality for the different user groups.

Results and conclusions: Distinct and complementary theoretical assumptions support the central thesis of the hybrid character of the university hospital. They include space perception in the peculiar hospital environment, hybrid buildings theory (Fenton, J; Koohlaas, R), and the role of architecture and design in the healing process (Ulrich et al). The explorative study and comparative analysis focus on typological models and design solutions that can sublimate the negative nature and of medical environments.

Although certain examples still present a pathological character, several salutogenic (Antonovsky) design solutions have been developed at different scales. In addition, when design promotes hybrid co-actions, architecture is able not only to mitigate and overturn the pathological space but it can also bring about a new leading and revitalising effect at urban, social and community levels.

Keywords: European university hospitals; Complex architecture; Healing environments



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P07 How to evaluate healthcare buildings: selection of methods for evaluating hospital architectural quality and usability – a case at St Olav's Hospital in Norway

This paper reports on a research project that determines indicators for assessment of different architectural layouts, patient and staff flows, and their experiences. The aim is to connect usability evaluation to the discussion on architectural quality of hospitals, and provide data and tools for future healthcare projects. There is currently no method that combines evaluations of physical spatial architectural layout, architectural quality, and usability, assessed by medical staff, patients and hospital architecture experts.

Method: To map the necessary topics, we used the Evaluation Focus Flower (Fronczek-Munter, 2013) – the first step in developing a set of tools for evaluating hospital architecture and usability more fully. We used a pilot project approach, selecting seven evaluation methods/tools that we believe, together, give a broad picture of hospital architectural quality and usability. The research was conducted at St. Olav's Hospital in Trondheim, Norway. The different methods were tested in one ward – the Rehabilitation Center (Nevro Øst) – to compare the process and results of the evaluation methods at the same location, and to choose the most efficient set of tools, covering a full range of hospital architecture aspects, for future hospital projects.

In this way, we compare the results of the chosen evaluation tools before we apply the same procedure and test the tools in other wards or hospitals. This approach tests more tools on one ward, with the purpose of covering the majority of areas from the Evaluation Focus Flower.

Results and implications: Seven evaluation tools are compared on objectives and results, for the development of a new set of tools for the evaluation of hospital architecture. This can assist further improvements of existing facilities, or development of programmes of requirements for new hospitals, based on evidence from cases. Collected data, by the tracking of staff and visualising it on BIM models of wards, can guide further studies of specific areas to find optimal solutions through simulations.



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P08 Kaiser Permanente Sports Medicine Clinic: clinical excellence in an unexpected setting

Kaiser Permanente is the leading not-for-profit provider of pre-paid healthcare services in the United States. With more than 10 million members, 38 hospitals, and 626 clinics, the organisation is growing rapidly in a competitive marketplace. Its model is to encourage its members to adopt healthy lifestyles through a range of wellness-oriented initiatives and, when necessary, provide a continuum of high-quality healthcare services in convenient, attractive and cost-effective settings.

The recently completed Sports Medicine Clinic in Sacramento, California embodies Kaiser's latest example of this approach in a venue that provides physical rehabilitation and sports therapy across the full range of Kaiser members, as well as for professional athletes. It's located in the new AECOM-designed Sacramento Kings Basketball Arena, which, in itself, is an architecturally distinguished component of downtown urban development, and achieves LEED Platinum and Zero Net energy ratings.

The clinic, entered from street level through its own branded lobby and lifts, is located in the high-bay spaces above the arena. It features sports-themed interiors, in which open and enclosed treatment and rehabilitation areas are interwoven with clinically-relevant fragments of gymnasium space, a green sports pitch, sprint lane, and basketball court. Daylight and views are provided through eight-metre-high windows to the outside and, internally, through electrochromatically controlled glazing to the arena below. The interiors are based on Kaiser's 'Total Healthcare Environment Standards', which are patient-centric, sustainable and, in this case, enlivened with large-scale action graphics of sports figures.

The result is to weave the provision of physical medicine into the continuum of life and recreational activity, enhanced by the motivational force of excellence in sports. It raises the bar and offers lessons for adopting and transforming community facilities into effective clinical settings.



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P09 Daylighting in practice – within surgical environments

Increasingly, research indicates that access to daylight and connections to the outside can improve health outcomes for patients and health status for healthcare staff. Conversely, the lack of access to adequate daylight has been demonstrated to have a negative impact in both populations. After studies showed the positive effects of daylighting, designers began introducing large windows with views to the outdoors in patient rooms and waiting areas. As the practice grew, family respite areas and staff spaces eventually 'saw the light', too.

Today, staff-friendly work environments promoting wellbeing and satisfaction to improve performance and productivity are a growing area of concern and facilities are taking the move further, incorporating daylighting into some non-traditional areas, such as the surgical environments. Studies suggest that having widespread access to daylighting at work increases satisfaction and may have positive impacts on lowering perceived stress levels among staff, increasing concentration. High stress levels, decreased concentration, fatigue, and low visual performance could result in lower performance and medical errors.

This poster demonstrates that modern layouts of surgical departments, enabling access to daylight and views to the outside, can be functionally efficient, without compromising patient safety, internal flow or increased travel distances. In contrast, limitations of daylighting within surgical environments (some procedures require specific lighting), as well as strategies to control daylight to prevent glare and unwanted heat gain, will be discussed. From case studies of several German hospitals, best practices of surgical departments and operating rooms with connections to the outside will be presented.



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P10 A healthcare oasis on the village commons: envisioning a healthcare campus as the social hub of an entire community

The design intent for the Woodlands Integrated Healthcare Campus (WIHC), a shortlisted competition entry for the Singapore Ministry of Health, was to provide a continuum of care that would encompass clinics, a 1400-bed acute-care hospital, a 600-bed sub-acute care hospital, and clustered 400-bed long-term care facilities. The design of the facility itself embodies an innovative urban design concept with potentially widespread applications: a healthcare campus that functions as a gathering place for the community at large.

The site for this hospital could be described as a 'placeless place' – a highway and a major traffic artery intersect at one corner, and many of the area's residents are construction workers who live in scattered, mid-rise housing complexes. Although the population density is high, the area lacks a social hub.

Inspired by the ancient Greek model of the agora, our team envisioned the Woodlands campus as a public plaza for the entire community. We proposed massing the buildings and digging them into the sloping site to provide acoustic insulation from the traffic arteries. At the same time, referencing the traditional architecture of South Asia's kampong villages, we elevated the buildings on stilts. Our concept for the WIHC campus was a pedestrian-oriented village commons – a place for food stalls, family recreation and socialising. Raising the buildings on stilts would also significantly improve cross ventilation on a healthcare campus, where 80 per cent of the patient beds will occupy what is usually naturally ventilated space.

The design competition entry for the Woodlands Integrated Healthcare Campus is about more than creating a healthcare 'oasis'. It represents an emerging school of thought around modern long-term care models and community integration. The campus's design encourages connectivity and person-to-person interaction, and, most importantly, helps define a sense of place for the community.

This poster will demonstrate the potential global applications for community-focused healthcare facility design through the lens of design philosophies and practical applications proposed in the Woodlands Integrated Healthcare Campus design competition entry.



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P11 Design competition transforms the facade of the Bristol Royal Infirmary

Once voted the ugliest building in the city, the Bristol Royal Infirmary (BRI) has been transformed by the addition of an elegant aluminium and glass facade, the result of an international design competition and unveiled in June 2016.

Purpose: The existing 1970s concrete façade presented environmental, safety and maintenance issues for the trust. Six national and international artists and architects were invited to enter proposals. A Creative Reference Group was set up to oversee the project, and three proposals were shortlisted following an evaluation process alongside public consultation. The competition enabled the trust to consider a range of innovative and creative solutions from world-leading artists and architects. It reflected the importance of the entrance to both the public realm, as well as to users. A good first impression welcomes and reassures patients and visitors, in turn reducing stress and anxiety, and ensuring a better experience.

Methods: The winning design, named 'Veil' takes the shape of an efficient modern skin made of powder-coated aluminium and glass, installed over the top of the existing structure, which will be maintenance-free and energy-efficient. The designers used the original vertical rhythm of the facade as the starting point of the new solution, creating a curved 'envelope' for the building, comprising an insulated aluminium rainscreen and integrated high-performance windows. Central to the vision for the new facade is an integrated lighting installation, which brings the building to life at night and which can be changed using loop timing and fading sequences to celebrate special days or events.

Conclusions: As well as providing a sustainable frontage with better airflow inside the hospital, the new facade also matches the excellence of the clinical care provided by the hospital and its staff, and inspires confidence among patients. It delivers a triple bottom line of economic, social and environmental improvement, and demonstrates the role that design competitions and reviews play in promoting design quality standards, as well as the creation of sustainable and compassionate healthcare environments.



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P12 The New Clínica Anglo Americana in Lima, Peru

The Clínica Anglo Americana is a nationwide referral private clinic located in the centre of Lima, Peru. The clinic wants to increase its activity to attend patients efficiently. The existing buildings and facilities are old and outdated. Technological advances in the human medicine branch requires a total reorganisation, remodelling and extension of its facilities.

The project has two main objectives: to create a high-quality private clinic in Lima, and to do it on the same site where the clinic currently stands.

The first step is to consider all stages of construction of the new building, taking into account the following:

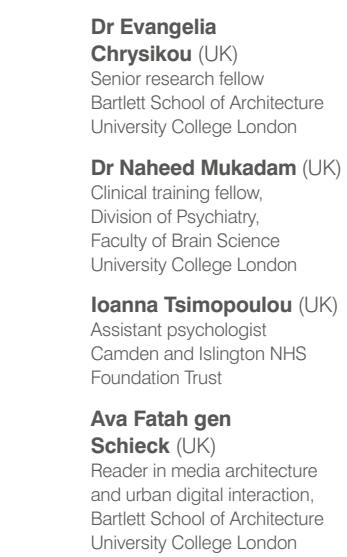
- construction phases must be physically possible, the existing buildings should occupy the entire plot, surrounded by four streets, and demolition must be carefully planned;
- medical activity cannot drop at any point during the construction, and the clinic wants to support patient care without reducing quality; and
- access must be ensured – pedestrians, cars and supplies must be able to get into the building at any stage of the construction.

The project comprises three phases of construction, along with the phases of demolition, previous works, temporary works, and upgrading of the public space around the clinic. There is a major first stage, which includes phases 1 and 2, so that, when completed, that clinic can function as a balanced set. The second stage, involving phase 3, will be completed when it's appropriate.

The functional planning of the new building has a very defined picture for the clinic. In the intermediate phases, some areas are moved to have basic patient care units at all stages.

The next step is to design a building with a high commitment to sustainability. Problems relating to energy, water, waste and materials are being studied and solved.

The project has been developed using building information modelling (BIM) to control large, complex processes and helping to visualise and clarify problems. It will bring clear benefits around collaboration and coordination of information when construction starts, allowing professionals from all disciplines to participate in the process.



Research indicates that recently created facilities in the community can become smaller-scale institutions, where mentally ill people lead isolated lives in poverty. This happens in countries that are able to afford excellent healthcare facilities for the general population, as well as in less developed countries where there are still asylums, such as Eastern Europe, India, and countries of the Gulf. The common factor is that mental healthcare remains the 'Cinderella' of any health service, with stigma the main cause of these inequalities.

Methods: This is a multidisciplinary, exploratory, research-through-arts project, involving one School of Architecture, one Division of Psychiatry of the Medical School, and one School of Art. It compares healthcare with mental health facilities of the same catchment area, raising awareness of inequalities and social exclusion through a visual, multimedia perspective. Methodology involves the mapping of the facilities compared with public transport, the visual comparison of their buildings to their neighbouring ones, and the comparison between the two groups. It juxtaposes mental health and healthcare facilities in access, condition and status compared with their surroundings.

Implications: There are clear policy implications that derive from that inequality of infrastructure and access to transportation for the reallocation of capital funding. With funding in areas such as dementia shifting towards technology and applications, this presentation demonstrates areas of the built environment that need attention.



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P14 Designing for change in specialist hospital areas

Often, the expression 'designed yesterday, built today, outdated tomorrow' is used in relation to hospital projects. Not only is the building process, from concept to completion, a challenge for the design team but because healthcare is so dynamic, the structure and specialist areas, in particular, need to be capable of responding to technological and clinical developments.

To demonstrate how design and functional requirements of hospitals change, this presentation will review some of the technology changes that have occurred over the last 20 years and their impact on hospital builds. It will consider other key influencers on hospital design, including changes in surgical techniques, social and cultural changes, and hospital-borne infections. It will also consider the relevance and limitations of Health Technical Memoranda (HTMs) and Health Building Notes (HBNs) in hospital design.

It will discuss how modern hospitals should be designed with the ability to change with the demands of ever-evolving technology, surgery and other clinical developments. It will also consider the need to adapt to social, cultural and regulatory changes.

The presentation will focus on the use of stainless steel and glass modular room systems in the construction of specialist clinical and technical areas of modern hospital builds, and how they can help meet many of the practical challenges of hospital construction.

The use of factory manufactured stainless steel and glass modular room systems is commonplace in the construction of operating theatres in northern Europe but is relatively new to the NHS and UK private hospital market. It's a solution that delivers the ability to change and upgrade with minimum disruption and cost to integrate new technologies. It's also a system that's suitable not only for operating theatres but also for endoscopy treatment rooms, imaging departments, cardiac catheterisation, laboratories, decontamination, and other technically complex departments.

This presentation and the use of modular room systems in highly technical areas of a hospital build will be of interest to healthcare architects, engineers, construction companies, hospital owners and clinical personnel.



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P15 Emerging models of cancer care: implications for facility design

This project explores society's future needs for facilities along the continuum of cancer care – specifically, emerging innovative care models and a shift towards personalised medicine. To address the research purpose, a systematic literature review was conducted, focusing on articles related to new cancer care models.

The goal is to move from fragmented and sequential care to fully coordinated care. To accomplish this, emerging value-based payment models are first explained because they are designed to improve quality and efficiency of healthcare delivery. Second, we discuss the National Cancer Institute Community Oncology Research Program (NCORP) hub-and-spokes model – a network of investigators, cancer care providers, academic institutions, and other relevant organisations, which facilitates patients' participation in cancer clinical trials and cancer delivery studies. Third, the 'four Ps' of patient-experience models are analysed:

- 1) Physicians
- 2) Providers/partners
- 3) Places where people come into contact with the first two 'Ps'; and
- 4) Processes that define the clinical care protocol and patient journey.

Fourth, emerging models of cancer care are discussed, and we conclude with characteristics we believe make up a 'dream team'.

Six implications of future facilities design were noted. First, we need to consider spaces for multidisciplinary tumour boards by tumour type through virtual spaces, or allow physicians to meet other physicians to discuss patient care and develop staging and treatment plans. Second, it's necessary to consider a hub-and-spokes model when we design cancer facilities linked to an academic medical centre. We need to design community cancer centres as regional hubs for cancer diagnosis and treatment that are relatively small and provide a comfortable home and family environment, while allowing for telehealth and conferencing technologies. Third, data collection, processing, data entry, and storage are key activities of cancer care in both community centres and hubs. Fourth, workplaces should be designed for large collaborative spaces with access to information and data as needed. Fifth, different specialties should be co-located; and lastly, flexibility should be built into facilities to ensure that the growing emphasis on preventive health and 'survivorship' can be accommodated.



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P16 Architecture of pharmacies: co-designing spaces that promote engagement with community pharmacy alcohol services

This first known programme of research proposes to understand how patients and staff experience the pharmacy environment when accessing NHS pharmacy alcohol-related services.

UK pharmacists' professional roles have changed considerably over the last 10 years. 'A vision for pharmacy in the new NHS' advocated for pharmacies to: be the first point of contact for the public to access health services; monitor outcomes; be a public health resource; and tackle health inequalities. This range of activities is undertaken in three primary spaces: at the pharmacy counter; in the consultation room; and within the dispensary area. It's estimated that a typical adult makes 12 health-related visits to a pharmacy each year. It's not known if the pharmacy environment acts as a barrier to greater engagement or whether pharmacy spaces are used to maximise their potential to support patients.

Alcohol is the third leading cause of death and disability worldwide. Only 6 per cent of the estimated 1.5 million UK dependent drinkers receive treatment for their drinking; up to 90 per cent return to heavy drinking within a year. Those who are at risk of alcohol problems are more likely to visit a community pharmacy than any other health environment.

The research asked:

- How do patients and staff experience the pharmacy environment when receiving or delivering pharmacy alcohol services?
- What features of the pharmacy environment support or hinder engagement with pharmacy alcohol services?
- What are the patients' and staff experiences of a co-designed virtual reality pharmacy?

Method: An adapted form of experience-based co-design will be used to design and test new pharmacy spaces, and explore pharmacy patients and staff experiences of these in virtual reality environments. Methods will include qualitative interviews, photo-elicitation and focus groups.

Implications: The findings from this co-design study will contribute to knowledge of patients' and staff needs, perspectives and aspirations of the pharmacy environment. The findings will also inform NHS commissioning decisions on how to optimise the pharmacy environments to promote engagement with pharmacy alcohol services.



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**P17 Design quality in healthcare environments:
how architecture and psychology can meet**

Last summer, the emergency department of Careggi Hospital, Florence was inaugurated an autism-friendly sensory room – the first example of a sensory waiting room in Italy and one of the few examples in Europe. The design concept of the healthcare environment aimed at reducing distress in hospital and meeting the needs of people with mental disabilities.

People with an autistic spectrum disorder (ASD) and an intellectual disability who need to attend a hospital emergency waiting room frequently present high levels of discomfort and challenging behaviours owing to stress-related hyperarousal, sensory sensitivity, novelty-anxiety, communication, and self-regulation difficulties.

Careggi's emergency waiting room is the result of a research project borne out of a collaboration between the technical staff of Careggi Hospital, the Center for Autism PAMAPI, the Department of Architecture at the University of Florence, and an innovative start-up with expertise in sensory environments. The relationship between architectural space and quality of life is explored to focus on users' needs and support medical staff in their work through a specific training programme.

The multisensory environment aims at helping sensory integration and relaxation. Visual communication using an iPad enables anticipated understanding of medical procedures and gives people with ASD an alternative way to relate with professionals. A technological system supports requests, choices and self-determination to fit sensory stimulation with personal preferences, and to self-build the environment for hypo- and hyper-sensitive people. These characteristics should ensure: better regulation of arousal; less behaviour problems; improving treatment accessibility; safety; and effectiveness.

The waiting room has also become a supportive environment for women who have been victims of violence or abuse. Finally, the sensory room is becoming a calming environment for professionals to improve their psychological comfort and reduce their stress levels.

Observation of this case study has taken place over the first few months, presenting several interesting points for research. Questionnaires for parents/caregivers and structured interviews for health professionals have produced results of patient-satisfaction levels, which will be presented.



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P18 A tale of three communities: the value of engagement in mental healthcare environments

Mental healthcare facilities are only as successful as their ability to interact with their communities. Many current schemes echo a village concept and/or normalised living regime, yet do so within an insular environment.

Mental health design must embrace community and contribute to it. Only a two-way conversation will truly normalise our perception of mental healthcare.

We will present three Canadian mental health projects through the lens of this paradigm. The concept and brief for each were developed in close dialogue with service users and caregivers, reflecting both the 'recovery' model and community integration.

Lutherwood in Waterloo Ontario is a small mental health centre for children aged 12 to 17. It promotes a recovery model by respecting all participants in a resident's journey, including the wider community. Through visioning sessions, the community became a vital participant in holistic care for kids. The remodel and extension of the 1500 sqm facility transformed a warren of poorly connected, cramped spaces into a bright, open centre with a new social space at its heart.

CAMH, the Centre for Addiction and Mental Health, is Ontario's main mental health provider, located in downtown Toronto. Seven years ago, the transformation began of the former asylum with a new masterplan that stitched the site back into the urban fabric. The first phase, a 50,000 sqm project consisting of three urban-scaled buildings, was completed in 2012, with the next phase adding 60,000 sqm. The design reflects the concept of 'good neighbour', successfully integrating seemingly opposing objectives of community use and mental healthcare.

Erinoakkids, a treatment and development centre across three sites in Ontario, specialises in behavioural and physical challenges for kids up to 19 years. The design was informed by themes of play, achievement and memory. Building and landscape were designed as interactive therapy tools for clients and community to celebrate every child's successes.

This presentation will demonstrate principles of behavioural health design that can create profound harmony between mental healthcare and community, blurring the boundaries.



P19 Neighbourhood health centre – a meeting and exchanges place for health

This project is based on a conceptual study for a possible future healthcare system that moves from reactive to preventive medicine. We developed a prototype of a healthcare facility located in a town centre, near to a shopping complex. It will promote regular physical exercise and daily nutrition habits, as well as information on healthy lifestyles.

Parents with children can drop off their children at this facility and visit the shopping centre. Alternatively, they can enjoy sport activities either together or separately.

The principle of this space is to move from “classical” to “numeric-therapeutic” architecture:

- Reception – the classical reception would be replaced by terminals for entering patient data (if necessary) and/or by information terminals. Visitors will be able to retrieve links to informative sheets related to their problems and the treatments to follow.
- Office space – the space would no longer be partitioned; exchanges would be conducted in open spaces or in a self-service cafeteria, but with silent zones to preserve patients’ privacy.
- Patio/landscape/urban architecture – interior and external gardens will be proposed for gardening, and for discovering medical herbs or plants that aren’t well-known, so that some patients could be treated with “horticultural therapy”. This environment could also be used for meditation. Medical herbs and plants could be used for dietary meals.
- Social space – space for different activities such as a cooking school, creative atelier, gardening, or DIY/Fablab will be dedicated to ergo-therapy and art therapy. A self-service cafeteria caters both for professionals and users to generate a familial ambiance.

These therapies aim to: help patients better manage (or forget) their illness; restructure their daily lives; help them recover confidence; and restore social ties.

Financial propositions: A partnership could be made with local shops, health professionals, and mutuals to finance different centres. Circular economy or shared economy principles will help deliver a decentralised, regional connected healthcare system and an “ageing in place” paradigm. A passive design system may be proposed to reduce energy consumption.

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P20 Re-imagining the hospital as community hub: can a hospital act like a community centre?

Modern healthcare facilities strive to be open, transformative and transparent community hubs fostering a family- and patient-centred healing environment while creating positive working conditions. They engage with the whole community to inform and educate, and promote social cohesion and wellbeing.

A panel of client representatives and architects will present the findings of a post-occupancy evaluation of three healthcare facilities, to see if they achieved the high level of community engagement their designs promised.

We selected the following three hospitals owing to their design focus on community engagement, their different cultural and regional settings, and their comparable time of operation.

South West Acute Hospital, Enniskillen, Northern Ireland: The design of this major acute hospital in a greenfield setting addressed the challenge of designing a large hospital that still felt human-scale, accessible and had a memorable sense of place. South West Acute Hospital serves as a boon to Enniskillen – sustaining opportunities for new jobs, small business start-ups, and social interaction, while providing higher-quality healthcare.

Bridgepoint Active Healthcare – Toronto, Ontario, Canada:

The complex continuing care and rehabilitation hospital not only transforms care delivery but also rehabilitates its site from one of isolation and incarceration to a connected community asset. The subject of one of Canada's largest post-occupancy studies, Bridgepoint scientifically measured the impact of design on health outcomes, and the results are now influencing change in facilities across Ontario and beyond.

New Victoria Wing and Great North Children's Hospital,

Newcastle, England: The scheme replaced outdated Victorian-era clinical buildings with 70,000 sqm modern tertiary care facilities and a new masterplan, which knits the campus to its community. The central hospital street runs the length of the hospital and includes shopping, dining and a cinema, which helps bring the hospital and local communities together.

This discussion focuses on the successful implementation of design principles that foster community engagement for healthcare facilities, transforming them from institutionalised structures to open community hubs.



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P21 Evaluation of change: design options of patient room configuration in a hospital medical unit

The basic component of the modern hospital has shifted from multi-patient to single-patient rooms, transforming the concept of the 'Nightingale' open ward to private rooms in inpatient units. At the same time, Israeli hospitals have also been striving to deal with high rates of over-occupancy in the winter, lack of medical personnel, and insufficient funding. Accordingly, the current recommendation of the Israel Ministry of Health is to design inpatient units with a variety of patient room types – single, semi-private, and multi-patient rooms – with an option to add an extra bed to most rooms in case of high-occupancy rates.

Although many studies have evaluated the advantages and disadvantages of single-patient rooms versus multi-patient rooms, only a few have evaluated the correlation of the patient room configuration with the overall design and performance of the inpatient unit.

A case study of the Sammy Ofer Heart Building at the Tel Aviv Medical Center, Israel, demonstrates the need to evaluate current inpatient unit layouts of patient rooms and compare these to future options for configuration change. This evaluation method, based on a literature review, observation and expert interviews, consists of analysing the form, function and use of the medical unit. Simulating 'what-if' scenarios, such as over-occupancy rates or new medical procedures, illustrates how each design option could support future change.

The results suggest that different configuration of patient rooms in a medical unit affords different opportunities and limitations for space flexibility, process efficiency and user satisfaction. This method of evaluation of future scenarios could promote design optimisation, collaboration among inter-disciplinary members of the project team, and enhance knowledgeable decision-making during the design process and throughout the lifecycle of the hospital.

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P22 Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems

Hospitals consume 2.5 times more energy, on average, than offices, owing mainly to the complexity of the building and utility systems necessary to accommodate energy-intensive medical equipment and processes.

The Streamer project focuses on the design phase of hospitals, because design decisions evidently have a large impact on the energy efficiency of newly constructed or refurbished hospital buildings. Streamer has generated methodologies and tools to assist interdisciplinary design teams in analysing and selecting the most energy-efficient design solutions. Streamer methodologies and tools are innovative for their applicability in the early design phase, where traditional design methods fall short in terms of semantic and holistic insight.

Streamer methodologies and tools are developed to be complementary with each other when applied in design practice, and comprise the 'semantic labels' design concept. This concept allows the designer to attach design-related semantic properties to space units (eg rooms) in the early design phase, even though much detailed information is still unknown. These semantic labels express the 'design rules', which capture the knowledge of designers and, in turn, help create and validate design alternatives.

Guidelines enriched with best practices for design teams also incorporate the viewpoints of various stakeholders (eg hospital manager, medical staff, patients, local authorities) who are involved in optimal decision-making concerning design quality, energy efficiency and cost effectiveness. These guidelines also contain organisational approaches to speed up the design process for new buildings and retrofit situations.



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P23 The impact of aged people and dementia-friendly environments in users' socio-economic inclusiveness

The United Nations (UN) reports that the global population is ageing rapidly with 11 per cent of the world's population currently over 60 years old – a figure projected to double by 2050.

A number of studies highlights the importance of the relationship between people and spaces, and how environments can positively affect the wellbeing of people as they age in place (Kerr, Rosemberg and Frank, 2012).

This study investigates the impact of this approach on older adults in the early stages of dementia, with a specific focus on examining whether existing urban and architectural factors enable them to be active in their communities and cities. Moreover, it will also preserve cities' diversity and their capability of providing something for everybody (Jacobs, 1961).

The first stage of this study is a literature review, with the second stage characterised by a post-occupancy evaluation (POE). The development and creation of a POE tool is influenced by a specific participatory design approach: a living lab. This approach has been robustly developed through the work of a European-funded project, which supported the partnership working activities of the following: Liverpool John Moores University; Mersey Care NHS Foundation Trust; HLP, an international architectural practice; Liverpool Service User Reference Forum – Dementia; and the Liverpool Dementia Action Alliance – Liverpool.

As the study progresses these partners will be actively involved in the methodological and data collection phases of the study. In addition, a number of case studies will be analysed through a one-time POE (Cutler and Rosalie, 2009). This analysis phase will be characterised by three parts: the thinking, the making, and the living of architectures or urbanisms. The aim of the analysis phase is to critically evaluate identified design strategies while teasing out their uniqueness, in order to create an innovative architectural theory that links to the overall aim of the study.



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P24 Support system: empowering people with osteoarthritis

It's estimated that 10 million people in the UK have arthritis, the most common of which is osteoarthritis (OA), affecting one in three people over the age of 45.

Aims: The objective of this project, funded by Arthritis Research UK, is to empower people, through a purpose-built digital system, to take control of their condition. The system will signpost them to the most relevant products and tips, enabling them to remain independent for longer by making everyday tasks more accessible.

Methods: A co-design and double-diamond research methodology was adopted. Interviews and observations have been carried out with 34 participants with OA, ranging from those newly diagnosed to those suffering from the condition for 20 years. All participants were over the age of 55. The products these individuals use and their general tips for everyday living were analysed and cross-referenced.

Results: Results highlight that routes to finding useful products are often unstructured and difficult, with many people unaware of what they're looking for or that a product even exists. This increases the pressure on healthcare staff, who are often tasked with supporting these patients' additional needs. Many people interviewed suggested gadgets and everyday products that aren't specifically designed aids. Many also felt that aids have negative connotations, carrying stigma and signalling 'the point of no return' or giving up.

Conclusions: These insights have led to creation of a database that helps signpost people to the most helpful products and tips. The database includes household gadgets, everyday products, and specifically designed aids – all of which have been recommended by research participants. Ongoing work will test these products further and link them with individuals' limitations (joints used and movements required). Owing to a lack of awareness about products, the system focuses search requirements on the problem, not the solution. Individuals are asked to define the task they find difficult, instead of them being expected to know what they need. This simplified approach aims to empower people to easily find the help they need in a cost-effective, stigma-reducing and speedy way.



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P25 The relation of visual impairment to the risk of falling among older adults

Elderly populations are at a higher risk of falling because they develop physical, cognitive, and sensory function limitations as they reach the later phase of life. Out of all the reduced abilities, visual impairment is the leading cause of falls. The correlation of visual impairments with the risk of falls among elderly population are inspected through review of research literatures related to the cases of falls and visual impairments experienced by older adults. Information derived from the literatures is then used to develop environmental design strategies to decrease the risk of falling among older adults.

Visual impairments limit the ability to collect visual information to construct a spatial understanding of the environment that older adults occupy. Several major age-related visual impairments also cause them to have blurred vision, distorted sight, low sensitivity to colour recognition, and loss of peripheral vision. Vision-related diseases affect elderly individuals' ability to detect hazards in low-contrast environments, judge distances, comprehend spatial relation, and process moving visual information. They find it difficult to locate steps (changes of level), clutter, spills and other potential hazards that cause falls.

Providing high-contrast colours on important room features such as steps, stairs and light switches help them navigate safely. High-contrast colour helps increase an individual's awareness of his or her surroundings. In addition, the response to depth perception limitation is to emphasise the edge contrast using a line of strong colour so older people can see the difference between each step. To prevent glare and give older eyes time to adjust to light differences when moving between inside and outside, it's useful to include transition space or overhang. Sufficient and uniform lighting is also helpful to improve awareness among older adults while they walk about and conduct daily activities.

Conditioning of environment is crucial to be part of fall-prevention strategies. There should be future collaboration that intersects the field of architecture, interior design, gerontology and kinesiology to further investigate and develop strategies to prevent falls among older adults with visual impairments.



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P26 Shifting elderly care: case studies of multi-generational communities in Europe and the USA

The development of more economically sustainable, community-oriented schema, where the collaboration and mutual support between residents could ease the economic and social burden for society, will gain increasing importance. Today, the elderly are independent and self-confident advocates of their own wellbeing and preferences, who want better preventive care and chronic care management within the 'normal' home environment.

The age-integrated approach, architecturally embodied in a multigenerational community, is targeted for the physical integration of various generations for mutual support and self-help. While the philosophy of multi-generational settings is clear, the design of this type of community involves the complexity of social, programmatic and built environment solutions that meet the diverse needs of a cross-section of individuals at different life stages.

The aim of this study is to explore how the concept of multi-generational community works in a real-life context and to seek design principles that create a mutually supportive and beneficial environment for all ages.

To do so, best-practice case studies research was undertaken and site visits carried out to existing multi-generational communities, in the USA and several European countries, recognised for innovative and viable approaches to age-integrated housing and services. Primary data collection tools included non-participant observation, with behaviour mapping, drawings, and filling out a physical and architectural features checklist. A literature review and analysis of documents (architectural drawings) were also conducted.

The case studies analysis has revealed qualities that contribute to the success of multi-generational communities. Preliminary findings highlight the importance of environmental behaviour mechanisms (such as: diversity of levels of social interaction; different types of privacy; safety; sense of identification with a place; personal interpretation of space; building a sense of familiarity) in fostering a sense of community, facilitation of interaction among different age groups, and prevention of conflicts between residents. Lessons learned can then be carried forward to provide recommendations for the future direction in the design of multi-generational communities.



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P27 Health Springs: an innovative wellness and fall-prevention approach for Singaporean elderly in high-rise housing

This paper proposes a new bathing archetype, 'Health Springs', as a community-based design intervention that promotes successful ageing and an innovative fall-prevention approach for Singaporean elderly in high-rise housing estates.

Context: Recognising the problems of ageing and using a health-promoting approach to elder care, Singapore's health policy favours 'Aging in place' as a long-term care strategy, by capitalising on the population distribution in residential estates. Focusing on design of the home environment may improve overall wellness at a large urban scale.

Focus: When examining older adults' health problems in relation to the home, falls are recognised as a prevalent challenge to geriatric care in Singapore. Investigation of falls in community and home dwelling shows environmental hazards as one of the major contributors, with the highest number of falls occurring in the bathroom. Overlooked, the costs of falls pose a burden on labour, medical and financial resources, and are expected to increase with the social phenomena of an ageing population in Singapore.

Method: Conducting focus group discussions and brief surveys with older adults and healthcare workers, the study explores existing fall-prevention strategies for bathing. The results are translated into design solutions streamlined through rigorous visual testing with an expert panel of doctors and occupational therapists.

Results: The study has resulted in contextualised understanding of the perceptions of Asian older adults and healthcare workers in relation to falls, and the resulting design implications. A further outcome is the proposal of a new design archetype, 'Health Springs' – an architectural and operational framework that aims to promote a higher quality of life and reduce falls among the Singaporean elderly.

Conclusions: Architectural and environmental interventions can assist in changing society's attitudes towards ageing. Physical interventions can promote better education and awareness within the community.



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P28 Patient falls in an elderly care/hospice setting

Objectives: The aim of this presentation was to study available records to identify risk factors that may have been contributing significantly to patient fall or fracture rates in four wards, providing elderly, respite and palliative care at a hospital in Ireland.

Method: The hospital moved to a new building and patient fall rates were calculated by analysing all 437 fall-accident reports, for patient falls that occurred during the year prior to and after the move. Data was transformed into anonymous format.

Results: The results include:

1. the majority of falls took place in bedrooms;
2. patients were slipping when attempting to stand up from beds and chairs;
3. fall rates in wards 2 and 3 had more than doubled and tripled, respectively, since moving to the new premises;
4. fall rates per bed year were lower than those measured in the UK; and
5. maximum fall rates for hour of the day occurred at 4.00am in Ward 1, at 10.00am in Ward 2, at 3.00am in Ward 3, and at 11.00pm in Ward 4.

Conclusions: In order to help reduce fall and fracture rates, it would be necessary to:

1. change the cleaning regime to maintain the original specified slip resistance of the floor;
2. provide patients with, and encourage them to use, non-slip footwear;
3. add 'Reason for Incident/Accident/Near Miss' to the report form to improve feedback;
4. place a focus on encouraging physical activity and exercise to promote muscle strength;
5. transfer frequent fallers with dementia from single to multiple-patient bedrooms, so that other patients may call for assistance on their behalf;
6. encourage patients at risk of falling due to medication or mobility problems to use Zimmer frames, to prevent them falling headlong in a sideways direction;
7. provide additional supervision in wards during hours of maximum fall rates; and
8. carry out further research into why fall rates in Wards 2 and 3 have substantially increased since moving to the new premises.



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P29 New schools, new learning – school as prevention and health promoter

The actual pedagogical innovation process within the teaching system in Hamburg and Bremen required the rethinking of the architecture of schools to meet new educational needs. Two new school projects offered the opportunity to investigate and define new concepts of learning spaces.

The aim was to redesign a built environment able to meet the following pedagogic principles:

1. Learn together in a community. The teaching activity overtakes the class concept and become collective with the teacher in the role of helper in the learning process and a member of an educational team. Learning programmes are no longer divided into single and separate subjects but are brought together in a cohesive, holistic and interdisciplinary didactic process.
2. Consideration of the individual learning process. The educational system promotes independence of the single person: each child is different and needs a personal rhythm – for example, a personalised daily plan to optimise learning efficiency, the possibility to move during the learning activity in order to prevent distraction, postural problems, etc.
3. School as a local health promotion centre. Pupils are practically involved in agricultural cultivation processes. They consume products in their own school kitchen and sell them at the local market. With a stronger relation to the neighbourhood, the school building assumes different roles: it becomes a district kitchen with cooking classes and nutrition consulting services, and a place for extra activities involving others and dissolving boundaries.

The study of this new concept has driven the planning process from the early project phase. The new teaching system not only necessitated new areas but the creation, too, of compassionate places, owing to a new architectural organisation overtaking traditional divisions in classes and subjects.

In this new open layout, light, ventilation and acoustics assume a key role in creating qualitative environments. Gardens and external areas become learning spaces with small domestic animals, plants and fruit trees following the seasons, and promoting contact with nature. Architecture becomes supportive of the learning process, an ecosystem in itself, and creates new environments enhancing culture and health.



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P30 Designing wellbeing into the built environment: 'Our Future Foyle'

The 'Our Future Foyle' project focuses on the River Foyle in Londonderry/Derry, Northern Ireland. The river, and its banks and bridges, have become synonymous with suicidal behaviour and self-harm. This has had a profound effect on the local communities' experience of wellbeing in this space. The project is funded by the Public Health Agency and has extensive stakeholder engagement.

Aims: The aim is to improve the wellbeing of local residents and reduce incidences of suicidal behaviour around the riverfront. Wider aspirations focus on how design can reimagine an area associated with poor emotional wellbeing. The objective is to co-create with the community a series of social and cultural interventions to increase the city's positive outlook towards, and use of, the riverfront.

Methods and results: The project involves residents in several design-led processes, including events and workshops. Initially, the project undertook observations of the site with riverside organisations, such as Foyle Search and Rescue, and has collected data from 597 residents of all ages. These engagements helped determine the positive and negative parts of the riverfront, highlighting areas that people felt needed intervention for increased wellbeing. Many engagement activities were held inside a co-designed research space – a major feature at two of the city's largest events, attracting crowds of up to 80,000 people.

Conclusion: Findings have verified existing data showing that incidences of suicidal behaviour fall when the river is busiest, driving interventions to promote the positive use of the space. Eleven briefs have been developed that focus on the physical, emotional and aspirational spaces around the river. Research points towards a tiered approach to suicide prevention that:

- creates a responsive community, alert to the needs of others;
- identifies key individuals to signpost and help those in distress;
- provides therapeutic and reflective spaces to aid wellbeing.

Current developments will see these briefs being progressed, co-designed and prototyped. Built environment interventions will include sensitively designed preventive barriers, which do not create the feeling of imprisonment, as well as community and arts interventions to increase footfall.



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P31 Acute psychiatric facilities: therapeutic spaces or stigmatising places?

Historically, psychiatric institutions have fulfilled several functions: they have provided social segregation and an environment to cure, treat or manage people suffering from mental illness. The acute mental health ward is now the equivalent of the mental asylum, but what informs its design and purpose, and whose interests does it serve?

Purpose: This presentation describes the methods and rationale for a new multidisciplinary study on the architectural design, therapeutic philosophy, and social regime of the modern acute mental health unit in New Zealand.

Methods: The research draws on perspectives from social science, psychiatry, nursing and previous case series research on the architecture of psychiatric care facilities in Europe and the UK. It specifically asks: what is the purpose of the new psychiatric space and what is the therapeutic philosophy? What is the architectural design and social regime of these institutions based on, and what are the effects on those who use and work in them?

This research has multiple data sources, including existing data: architects' briefs and plans; consultation documents; business cases for building refurbishment; and grey literature. The research will also carry out in-depth interviews, focus groups and stakeholder group tours, to gather the 'institutional knowledge' of mental health consumers, nurses, and other health professionals and visiting family members to understand ward users' experiences and knowledge of design elements of acute psychiatric facilities.

Analysis will involve: triangulation of four project components; architectural audit; space syntax analysis; interviews with ward users (mental health consumers, nurses and allied health professionals, family members); focus groups with indigenous Maori stakeholders, policymakers and decision-makers; and documentary analysis.

Results: This is the beginning of a three-year project. Results from the New Zealand case series will be compared with those from the UK and European experience.

Implications: The findings will challenge the current paradigm of acute mental healthcare and establish an evidence base that stimulates new directions for acute psychiatric facility design in New Zealand.



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P32 Designing with care: hospice design since 1980

This presentation reports research on development of hospice design since 1980, and guidance on how hospice requirements are likely to change in future.

Method: Stage 1 (completed): We visited 12 significant hospices and interviewed more than 50 key stakeholders, including CEOs, hospice managers, doctors, nursing staff and facilities managers. We also interviewed independent experts in hospice care. Stage 2 (currently underway): Post-occupancy evaluation of one hospice piloting a variety of evidence-based methods, including established design toolkits.

The results will be: analysed against hospice-specific patient data from 1990 and 2015 to understand the impact of the design on the changing user profile; interrogated to determine whether key 'intangible qualities' can be interpreted from the built form – namely intimacy, trust, empowerment, compassion and coping.

Findings: Key considerations emerging from stage 1 include:

- The need to focus on value rather than cost;
- Debate over single or shared bedrooms;
- Increased walking distances within purpose-designed hospices;
- landscape design and bringing the outside into the building;
- Younger patients with increasingly complex needs;
- Increasing dementia levels aren't as significant as expected;
- Larger equipment owing to manual handling requirements;
- The importance of a spiritual space;
- The impact of increased emphasis on infection control;
- Architectural understanding of hospice care and design;
- How to cater for young adults within hospices; and
- Design needs to facilitate dignity, privacy, intimacy, trust, empowerment and compassion.

Conclusions: The research seeks to 'close the loop' with respect to hospice design processes, and reinforce an evidenced-based approach. When all stages are complete conclusions can be drawn on: what has worked and where improvements can be made; key factors in determining the success of a hospice building; how hospice design can respond to the changing context of healthcare design in the UK; and how to establish the value of good design for palliative-care patients using hospice facilities.

Our research addresses a variety of educational, professional and societal issues that promote design excellence as active in improving end-of-life experience.



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P33 The design concept of common places for healthcare centres: a review from Turkey

Health structures are social facilities that serve nearly every person in society. In addition, they require many places, including: an entrance; waiting areas; outpatient clinics; nursing units; operating rooms; emergency rooms; administrative and academic units; technical services; corridors; and toilets.

Patients, visitors, academic staff and medicine students all use common places of hospitals. In contributing to the design of common places of health structures, the common places of Hacettepe University's Faculty of Medicine entrance door Number 7 were examined. Correct and incorrect applications were specified and design recommendations were made.

Health structure examples from Turkey and around the world were examined by scanning the literature, including electronic resources.

This study aimed to analyse the health structures by using the example of Hacettepe University's Faculty of Medicine entrance, and prepare a foundation for hospital interiors that may better serve society. Since the topic of health structures is so broad, the research scope is limited to exterior and interior, general (common) places.

Finally, design requirements based on user needs of common spaces are provided as a list of items. The history of Hacettepe University is highlighted and sufficiency of hospital common spaces is specified.



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P34 The role of contemporary artworks in GP waiting rooms

In 2016, Paintings in Hospitals and the Wallace Collection commissioned work for four GP surgeries across London. This paper reports on research that sought to understand how people interact with contemporary artworks installed in GP surgeries, and to capture the impact of artworks on patients, staff and visitors, and the built environment.

A further aim was to understand how artists could respond to the environment of a primary care setting. The research explores if and how these aims were achieved, and how well they were understood by those who frequent the sites. It asks if contemporary visual art is of interest to those visiting GP surgeries and how diverse audiences may respond to contemporary artworks.

Method: The research included ethnographic observations in two GP waiting rooms in which artworks were installed. Auto-ethnographic observations were undertaken at an exhibition. A focus group with patients from one of the GP surgeries, and semi-structured interviews with GP managers, reception staff, the artist, and staff from Paintings in Hospitals and the Wallace Collection were also undertaken.

Results: A number of intense engagements with patients were observed. Patients spent longer actively engaging with the artworks than visitors to the gallery.

The amount of visual and audio noise appeared to impact on the number of interactions between patients, but not engagement. The artworks formed a point of discussion between patients, and between patients and staff, who used them as ice-breakers. Engagement workshops with patients facilitated structured discussions and provided contextual information about the artwork and artist.

Conclusions: The findings suggest that contemporary art can help support communication between patients and staff, and that it can prompt meaningful discussion. Further, it raises questions about how artworks should be selected for healthcare settings, and the extent to which patient/staff preferences should influence these decisions. Engagement workshops that facilitate structured discussions and provide contextual information about the artwork and artist were found to enhance understanding, suggesting these should be integrated into exhibitions in healthcare settings. More research is required on how artworks can become focal points in such spaces.



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P35 Please remove shoes: shoe removal practice, transitional space, and human health

Scientific research has shown that shoes carry huge amounts of harmful bacteria that can negatively impact our health. A landmark study by microbiologist Charles Gerba uncovered an alarming 420,000 units of bacteria on the bottom of shoe soles within a period of only two weeks. In outdoor environments, shoes carry multiple contamination agents from asphalt, mud, grass and sand. Wearing shoes indoors can accumulate floor dust mass and increase the risk of potential health hazards.

In the US, Europe and many other parts of the world, it's customary to wear shoes indoors. Yet, in many parts of Asia, such as China, Indonesia, and Thailand, people are accustomed to removing shoes before they enter interior spaces, especially in domestic residences, as well as houses of worship, schools, workplaces, museums, and elsewhere. The Japanese appear to be the most stringent in adhering to this practice, perhaps because they provide dedicated transition spaces called "genkans" for storing shoes.

This study examines the significance of Japanese genkans as transitional spaces for shoe removal. Characteristics of genkans are inspected through photo analysis to understand how architectural elements define thresholds between different types of interior and exterior spaces in Tokyo. The presence of transition spaces right by the front door offers a break from outdoors to indoors. Using behaviour-setting theory as a reference, the visibility of shoe storage and the change of material, colour and level emphasises exterior-to-interior spatial division, and guides people to remove their shoes.

The findings from photographic tracing are used to construct conceptual plans and section diagrams to design such designated threshold space to more safely transition from outdoor to indoors – an important way to reduce the threat to human health.



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P36 Breaking out of the Snow Cave – the significance of colour in healthcare environments

The positive effect on health outcomes of beautiful objects, their variety, and brilliance of colour has been observed for at least 120 years. Nevertheless, white-walled hospital environments are still found that lack the stimulation of aesthetic objects and colour. While various studies have been carried out on healing arts and colour, to develop an evidence base for empirical observations, current evidence is scarce, inconclusive or questionable.

The authors set out to expand and qualify the evidence base for the significance of art and colour in healthcare environments by using an anthropological methodology. Two qualitative experimental case studies were carried out in two hospitals. Ninety-eight hospitalised patients, situated in five day rooms and 14 single-bedded patient rooms, were interviewed, and a larger sample was observed. Additionally, quantitative data from thermal cameras, a psycho-physiological EEG-experiment, a ranking study, and a survey informed and qualified the analysis of the qualitative data.

The study concludes that the presence of coloured visual art in hospitals contributes to health outcomes by improving patients' wellbeing and satisfaction. Moreover, an analysis of data from primarily qualitative interviews, the ranking study, and the quantitative survey found the element of colour in visual art to be of more significance for patients' experience and use of the art, in relation to its composition and motif.

Overall, patients preferred art in brighter colours. Furthermore, patients experienced more positive memories and emotions if they perceived the colours of the art as brighter. The overall experience of the artworks was shown to be more positive for the brighter perceived pieces than the darker pieces. Finally, in social interaction, the art featuring brighter colours was used to a higher degree and received more positive reaction to art featuring darker tones.

From this, the study clarifies the potential of colour and art in hospitals while expanding and qualifying the current application of guidelines in healthcare environments.

Keywords: Colour; Wellbeing; Healthcare



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P37 Waiting well: start as you mean to go on

Compassion in care starts long before patients and visitors encounter a health professional. Their perception of the quality of care can be positively influenced by a warm welcome at the door, as well as the environment in which they arrive and move through en-route to their appointment.

Waiting well has the potential to support expectation of excellent care, communicate the provider values, and reduce anxiety about the upcoming medical appointment. A calm, stimulating, well laid-out environment can limit uneasiness and disorientation, as well as provide comfort and distraction. How, then, do we 'wait well'? This presentation discusses the following five core principles to apply when designing waiting spaces.

- A sense of arrival is created with a strong, consistently branded and well-lit reception that faces the entrance, and an active and personal greeting is encouraged by the arrangement of furniture, with access to all – both serve as indicators of respect to the visitor.
- Maintaining privacy in a restricted space can present a challenge, and in achieving visual and acoustic separation, we borrow solutions tested in hospitality and commercial projects, with self-check-in kiosks available for added privacy.
- Seating areas are positioned with strategic views wherever possible, and natural daylighting is augmented through carefully selected finishes. A view to nature provides a relaxing distraction, while artwork and good lighting can aim to achieve a similar effect.
- Reassuring comfort to help alleviate stress through provision of comfortable, stylish seating items catering for varying sizes and levels of ability. Finishes enhance acoustic performance, and with availability of refreshments, we aim to recreate a hotel ambiance by providing a full sensory experience of textures, smells and sounds.
- Clear wayfinding can instil confidence in visitors for their onward journey. Access routes can be highlighted with lighting and bold colours, as well as clear, consistent signage.

The waiting experience can be a relaxing interlude or an irritating intermission. We examine how the design can contribute to making it part of a positive experience in healthcare.



David Stavros (Canada)

Principal
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B+H Architects

P38 Healthcare design that empowers patients to make a return to independent living through environments that foster community support and reinforce identity and purpose

The existing Changi General Hospital (CGH) served as a medical clinic, staff administration building and inpatient acute care unit. Owing to a shortage of sub-acute space, patients with less severe complaints were kept in acute care for as long as two months. Two new buildings were designed to alleviate these strains on the system. Completed in 2015, the integrated building accommodates long-term elderly patients who have experienced mobility impairment, while the annex building, currently under construction, and will further alleviate pressure on the main building when clinics and administrative offices are decanted into it.

In Singapore, elderly individuals recovering from a stroke, a fall or some other mobility-impairing event are traditionally cared for at home, but this has become increasingly untenable. CGH's integrated building creates a care environment that is homelike. At the same time, it ensures that people beginning their recovery have ample privacy, while those whose condition is improving are able to transition to increasingly social, independence-promoting settings.

The typical, six-bed model for wards in Singapore is three beds along one wall facing three beds along the opposite wall. Our model for the integrated building is a five-bed 'house' incorporating the equivalent of a back yard and front porch. In most cases, three five-bed houses cluster on to a shared 'back yard': a sheltered exterior courtyard. We've inserted a semi-public 'front porch', where patients can begin to regain their independence through tasks, such as preparing tea for visiting family members. Houses also contain large dining areas, where families can eat together. Patients who have regained sufficient mobility begin to use shared rehabilitation areas on their floor, and when they're nearly ready to return home, they can practise independent living skills in a model apartment in the podium, below the inpatient floors.

This paper will demonstrate how the design philosophy for the integrated building has empowered patients to make a return to independent living through environments that foster community support and reinforce identity and purpose.



Louisa Williams (UK)

Founder and director
Art In Site

Martin Jones (UK)

Director
Art In Site

P39 Making art for people with the most challenging forms of dementia, at the Continuing Care Unit, Lambourn Grove

Art projects for people with dementia often follow strong conventions, two of which are:

- I. "Images" – either curated photographs or illustrated murals, depicting sites of local interest or history; and
- II. "Memory boxes" – boxes placed outside the room/at the bedside of the person marking personal space, filled with personal effects, often useful in sessions with occupational therapists.

An art scheme was developed for the Continuing Care Unit, Lambourn Grove, which aims to take conventions in fresh, new directions to explore possible untapped benefits.

Method: The project team led workshops to gain insights about the interacting needs of people with dementia and the wider community. As the workshops progressed, a strategy emerged: to shift the focus away from images and references to the past/memory, and instead towards tangible objects and playful interactions in the present.

Outcomes: The project incorporates the following features:

- "Shelf Work" – a bespoke shelf, featuring everyday objects that can be swapped, handled, and rearranged by anyone, adapting the model of the "memory box".
- "Floating Disks" – an arrangement of photographs of local interest and social life, presented in disks, which can be flipped to reveal other images.

Implications: These are listed as follows:

- People with dementia have capabilities/interests that are unused. By revealing these capabilities, fresh insight into the person and their condition can be provided.
- The "mantelshelf" model can facilitate personalisation of the environment in a safe way, bringing the benefits of the memory box/stimulation room to the rest of the care home.
- The best results arise if patients and staff/family collaborate on the same workshop exercises together.
- The scheme disrupts the "able/impaired" hierarchy, inviting carers, dementia patients and families to interact with objects together as social equals. This may help foster stronger community.
- Emphasis on objects and playful interactions engages users' proprioception, vestibular and touch perceptions.



P40 Project of the largest hospital in the eastern part of Russia

The Regional Clinical Hospital has been an important part of the regional and urban healthcare system since World War Two. Hospital beds are placed in two main buildings, which were built during two different construction periods: the first period in 1940, and the second in the late 1980s. The hospital contains a polyclinic building in a very poor condition from the 1960s.

The hospital provides specialised care in 58 fields of medical services, with 37,000 patients from Krasnoyarsk, its region, and the nearby regions treated annually by the hospital, which has 2500 employees. The hospital is also a major research and education centre.

The 29th World Winter Universiade will take place in Krasnoyarsk in 2019, and the Regional Clinical Hospital is on the official list of the Universiade healthcare facilities. For this special event, a new surgical facility will be constructed with 615 surgical beds and 108 intensive-care beds, along with 28 three operating rooms. A new emergency room will also be built.

Following the winning of the design competition for this facility in 2014, we spent almost two years developing the project to build largest hospital complex in Russia. The result includes four construction stages of seven new buildings, along with renovation and partial demolition of the existing ones. Treatment buildings are interconnected with above-ground and underground passages.

By June 2017, the project will have passed state examination and the first construction stage will be up and running. By 2019, as soon as the regional authorities provide funding for its construction, the Surgical Center will be built. All the remaining stages will be implemented over the next 10 years. The newly built facility will receive three times more patients annually than it currently does, and it will provide medical advice for thousands of outpatients.

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P41 Towards new master plan 2.0

Although masterplans have been used in France for centuries (as illustrated by the Louvre's 'Grand Dessein'), the masterplanning process for the hospital environment is still poorly promoted by public healthcare institutions. Despite official reports pointing out the lack of overall visions in recent investment projects (eg French Senate, French Audit Office), not many hospital managers have a masterplan at their disposal to help them organise their property and building strategy. Few projects have been truly designed according to a masterplan – even in the case of university hospitals.

In this respect, hospital managers from the Commission Ingénierie et Architecture have worked together to design a standard masterplan process. Based on solid feedback and proven successes, this process becomes a powerful tool to ensure every investment project is underpinned by an overall vision.

The masterplanning process, according to this new standard, is defined as: the condition to guarantee coherence between "the architectural object" and its current and foreseeable environment; an unprecedented tool for interaction and co-construction between the client and the designers; a scheme to ensure the conditions for true scalability; and a potential land-use planning tool in the context of healthcare evolution towards smaller hospitals.

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P42 The use of art to support wayfinding across complex health buildings

The 3Ts (Trauma, Tertiary and Teaching) redevelopment of the Royal Sussex County Hospital is a £486 million programme to deliver new state-of-the-art healthcare facilities. Construction will take place over eight years with completion due in stages between 2020 and 2024. More than 50 wards and departments will move into the new buildings, which will include outpatient, inpatient, specialist services and a new cancer centre.

Complex healthcare buildings such as this require great wayfinding. Evidence shows people rely on verbal directions and landmarks, as much as signage.

Purpose: The 3Ts redevelopment is adopting a systematic and integrated approach to using art, colour and signage to support wayfinding.

Artworks will identify key junctions and points of arrival, differentiate floors and lift cores, and provide visitors with straightforward, enjoyable journeys. Using artwork not only makes navigation easier, but it also adds a human touch and creates a strong sense of place.

Methods: Wayfinding across the buildings functions across four lift cores, which have each been assigned a theme and main colour. The themes selected to create a sense of place are: The Downs, Sussex, Coast, and Brighton. Colours have been selected to tie in with the themes and imagery linked to each theme will be commissioned.

The project aims to embed the values of the trust in its environment, in particular, communication, kindness, working together, and excellence. Community engagement will help identify local landmarks across Brighton and Sussex. Community and staff consultation around the selection of final commissioned images will ensure they are recognisable and describable.

Evaluation: An evaluation will inform the development of the project, as well as result in learning and good-practice guidelines.

Conclusions: This project integrates art, architecture and design for health and wellbeing. It breaks new ground in taking an evidence-based, systematic approach to using art to support wayfinding. It will provide a stimulating, calming and efficient environment. Through commissioned art that reflects a sense of place, it will help patients, staff, families and carers connect with a narrative that is meaningful and enjoyable.



Shireen Kanakri (USA)

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P43 Links between art pictures in classroom and repetitive behaviours in children with autism: an observational study

The objective of this study is to explore the impact of art on children with autism in school classrooms. Empirical research on this topic will provide information on how interior space features and spatial environment characteristics can be used to support the learning and developmental needs of children with autism.

Specifically, the connection between repetitive behaviours and art pictures in school classroom environments was observed in four classrooms. The occurrence of repetitive motor movements, repetitive speech, ear covering, hitting, loud vocalisations, blinking, and verbally complaining in relation to art wall pictures were analysed using Noldus Observer XT software.

As hypothesised, a correlation between art with nature and frequency of target behaviours was found; that is, as abstract art drawings, several of the observed behaviours occurred with abstract art. Further empirical testing is necessary to test a causal relationship between artwork and autism-related behaviours, and sensory discomfort as a mediator of that relationship. Findings are applied to the development of classroom design guidelines.



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P44 Creating compassionate environments using integrated and bespoke quality influencing and learning tools to support health and wellbeing of people affected by cancer

A growing body of evidence demonstrates the impact, importance and value of good design at all stages of the cancer care pathway and contributes to better health and wellbeing outcomes for patients and staff.

The Macmillan Quality Environment Mark (MQEM) supports patients' diverse needs and preferences in how the environment is designed, planned and used. High-quality, compassionate cancer-care environments translate the key principles of MQEM: accessibility; privacy and dignity; comfort and wellbeing; choice and control; and support, and apply them to four different domains: design and use of space; the user's journey; service experience; and the user's voice.

Additional components of Macmillan's quality project cycle include post-occupancy evaluation (POE) and an evidence-based design tool.

Application: Creating an inspirational and therapeutic sense of place is paramount, and we build around the needs of the individual to create a homely and welcoming space, which says "we care and we have thought about you".

Imaginative and intelligent use of space, interior design, and integrated art and gardens feature highly in recent projects so that people feel comfortable during treatment or palliative care, and/or when seeking advice and support.

A selection of sites across the cancer care continuum will be presented, demonstrating efficacy and utility of our bespoke quality influencing and learning tools, and how we work with partners to deliver exemplary environments.

Outcomes: There is a number of ways in which the impact of our work is measured, including stakeholder and user feedback on all aspects and stages of the development, and implementation cycle of our builds. A knowledge platform incorporating our evidence-based design tool is in development.

Implications: As the shape and context of cancer care settings change, translating our findings to ensure a fit-for-purpose space remains core in our work. This means that users continue to be recipients of high-quality cancer environments, which support their treatment, ongoing support and advice needs in a compassionate, caring and person-centred way.



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P45 I can hear but I do not understand: impaired recognition of environmental sounds in patients with dementia

Impairment of central auditory processing is a well-known symptom of neurodegenerative dementia. However, while numerous studies have examined verbal processing impairment, few, to date, have attempted to describe impairments of non-verbal, environmental sound recognition in patients with dementia. As these impairments may have direct implications on patient support and care, such studies are urgently necessary.

The aim of the study was to determine whether the recognition of meaningful environmental sounds is impaired in patients with mild or early-stage neurodegenerative dementia.

Methods: We developed a test of non-verbal sound recognition consisting of 16 sound sequences from the living and non-living environment. We involved 18 patients with mild cognitive impairment and mild dementia owing to Alzheimer's disease and frontotemporal dementia, as well as 20 cognitively healthy controls.

Results: Patients were given the test of recognition of 16 meaningful sounds from the living and non-living environment. Patients with dementia performed significantly worse in comparison to cognitively healthy controls. While healthy controls correctly recognised 12.1 +/- 2.2 out of 16 sounds, cognitively impaired patients recognised 9.2 +/- 2.5. Correlation analysis showed that the Mini Mental-State Examination (MMST) scores were positively correlated with the number of correctly recognised sounds (MMST: $r = 0.556$; $p = 0.017$).

Discussion: The fact that patients, even in mild stages of Alzheimer's disease or frontotemporal dementia, either do not recognise or misinterpret environmental sounds must be taken into consideration, not only in everyday life but also when patients need to leave their familiar living environment, whether temporarily (eg hospitalisation) or permanently (eg nursing home admission).

Keywords: Dementia; Hearing deficiency; Central auditory agnosia



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P46 Making frailty a priority: experiences of an innovative GP-led multidisciplinary approach to frailty within secondary care

We demonstrate the importance of facilitating a 'transition of care' for frail patients through use of a central multi-disciplinary hub.

This presentation is based on the experiences of an innovative GP-led multi-disciplinary team (MDT) based in secondary care. It highlights the importance of supporting a 'transition of care' to prevent admissions via GP liaison nurse, and reduce readmissions via MDT and community follow-up.

Relevance and impact: Frail older patients are vulnerable, complex and prone to dependency. Recurrent and prolonged hospital stays are detrimental to patient wellbeing and costly to the NHS economy. Over 50 per cent of readmissions were occurring within the first seven days of discharge. These factors drive demand for fully integrated MDT working to facilitate a 'transition of care' between primary and secondary care, ensuring appropriate care is delivered in the appropriate place.

Through working collaboratively with various healthcare professionals and providers, social care, and the voluntary sector, we're able to identify patients' needs in a holistic manner, and this collaboration is augmented through inter-professional learning.

Outcomes: Patients whose transition of care was facilitated through the MDT process had an average length of stay of 5.1 days and a readmission rate of 17.6 per cent. This reduction in length of stay and readmissions, compared with an age and presentation matched cohort, represents a potential reduction of more than 4000 bed nights in the past three months.

Discussion: Outcomes suggest patient and cost benefits as a result of collaborative working. Positive early signs and support from the trust and wider health community have secured funding for ongoing development.



Didier Bourdon (France)
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P47 Towards a vision of ‘the hospital of tomorrow’

University hospitals in France (CHUs) have organised a conference for director-generals aimed at defending the special interests of these healthcare facilities. The organisers of the conference asked a thematic ‘sub-conference’, the Commission for Engineering and Architecture (CIA), to explore what the hospital of tomorrow might look like, and to establish a vision by defining some of these main characteristics.

On reflection, it was felt that this hospital of the future should prioritise responding to four key developments:

- the search for increased economic and functional efficiency;
- new-generation medical projects;
- expected scientific and technological changes; and
- social and environmental responsibility.

This poster details the impact these developments are having on the evolution of hospitals and tries to harmonise the characteristics that would help the hospital estate in meeting them.



Jane Carthey (Australia)
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HDR | Rice Daubney

P48 How effective inter-professional collaboration between designers, clinicians and managers can improve the design of healthcare facilities

Many people collaborate to design a healthcare facility, making decisions, weighing up priorities, and developing solutions that balance often-competing needs. The role of the architect as lead designer, however, is increasingly under threat, with design or aesthetics often relegated to a lesser role compared to functionality or fitness for clinical purpose.

The first stage of this research considers how the expertise and professional cultures of project team participants can be used more effectively to achieve higher-quality design outcomes without sacrificing functionality or other priorities.

Recognising that contemporary procurement processes often view the architectural designer as a 'cost', this research investigates how this attitude impacts on the effectiveness of design processes and outcomes. It examines how non-design professionals (clients, clinicians and managers) work together with design practitioners, such as architects, to design a healthcare project. It considers how different professional discipline perspectives generate diverse priorities and different ways of engaging with the design process. On occasion, this can result in perverse outcomes and suboptimal design solutions.

An in-depth review of government and other client documentation used to guide the design of healthcare facilities will be analysed, examining the tender, contract and other documents used by government health departments and other client bodies in Australia, New Zealand and the USA.

It will also consider how the results of an online survey and targeted interviews of healthcare facility clients, managers, clinicians and designers can be used to understand how diverse groups experience the design process. Most importantly, it aims to discover opportunities to improve on current practices, so that these may be tested in future phases of the research.

By working together more effectively, teams comprising designers, clinicians, managers, patients and others can improve the design of healthcare facilities so that the physical environment better supports the delivery of health services across the care continuum.

More effective teams will also create more compassionate settings that promote the health and wellbeing of patients, the community, and those who work in these facilities.



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P49 A critical component in sustainable global health: mental health

This presentation focuses on the role and importance of mental health in achieving sustainable global health – an ambition that the World Health Organisation (WHO) has pursued since 2012, when it adopted an action plan (resolution WHA65.4) in recognition of the importance of the issue.

It's accepted that disproportionate higher rates of disability, morbidity and mortality exist for those with mental disorders. It's been shown that in developed nations, those with serious mental disorders die up to 25 years sooner, and those with depression die between 40 and 60 per cent earlier, than people who are mentally well. In low- and middle-income countries, between 76 per cent and 85 per cent of those with disorders receive no care for their disorders; in high-income countries, the lack of care is still high at between 35 and 50 per cent. This creates a drain on both health and justice resources, and greatly affects the productivity of a community. WHO estimates global economic loss attributable to mental disorder at about \$850 trillion a year, for the period 2011–2030.

It's also known that development of mental disorder is related to the physical environment, while animals can play a role in mental health therapy.

This presentation provides validated global and quantifiable data, along with case study-specific programmes, which have shown positive outcomes. The physical planning and design opportunities that help a community respond to mental health problems are also addressed.

Comparative analysis of different programmes and approaches provides insight into the breadth of the issue and some potential solutions. These solutions result in better overall health conditions and a reduction in mental health disorders, as well as an increase in safety, security, dignity, productivity, friendship, and a sense of belonging and community.

This presentation raises the discussion about mental health, lessons learned, and lessons still to be learned, to help in the pursuit of global health.



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P50 Design evaluation of high-level isolation unit – development of design requirements framework

High-level isolation units (HLIUs) are highly specialised facilities where the most hazardous infectious diseases are treated. Twelve units across Europe and in the United States treated patients with Ebola during the 2014–16 west Africa outbreak. Each unit was built to an individual design, which had a discernible but unquantified impact on how the unit operates, and the staff and patient experience.

During 2016–17, a three-month design evaluation has been undertaken to provide a detailed cross-disciplinary analysis of clinical processes with architectural design and construction at the Royal Free HLIU. The collaboration between the HLIU team, UCL Centre for Clinical Microbiology and the Bartlett School of Construction and Project Management involved three phases:

- literature with desktop-based data collection and space-use analysis, semi-structured interviews;
- situated data collection with observation of clinical process at the HLIU; and
- production of a design requirements analysis framework optimising coordination of processes and activity to space use, including movement between, and activities within, rooms.

The aim of this design evaluation was to develop a critical design requirements framework for facility use that allows international comparison of high-level isolation units, with the objective of improving the patient and staff experience in these units.

This framework will be available internationally to enable structured comparisons between HLIUs, lead international design practice and guidance, and enable planning for resource resilience.

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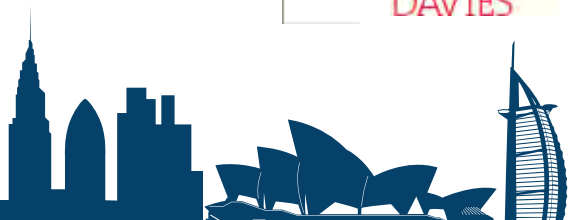
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ARCHITECTS FOR HEALTH

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Architects for Health

Architects for Health (AfH) is the UK forum for healthcare design.

Design of hospital or clinic environments is important for the wellbeing of patients, their friends and families, and people who treat and care. Good design enhances the experience of care and has a positive influence on clinical outcomes. AfH promotes design of better settings for healthcare by providing a forum for the exchange of ideas, promoting best practice, and recognising and rewarding excellent examples of healthcare design.

We work to bring about strategic change to the complex processes of planning and development. Drawing on the practical experience of our expert membership, we aim to make a difference through our work streams on procurement, guidance, strategic planning and design quality. We engage with and influence wider health institutions and communities.

As a non-profit organisation, with 300 members, we build knowledge networks that inform and support the future design of high-quality healthcare environments. We share ideas, experiences and examples through our growing membership links across the UK and Europe.

Membership

We welcome members from both health and design professions who share our values across healthcare planning, design and delivery. We bring together ideas from clinical practice and architectural design. Our members benefit from displays of our projects at national conferences, discounts to events, information exchange and collaboration, CPD opportunities, and support for ideas for AfH activities and projects.

Programme of events

Our annual programme of activities promotes a better understanding of health planning and design issues, and keeps members informed across the whole range of healthcare topics. All activities are wide-ranging and include joint events with clinical societies and Royal Colleges, or with representatives of organisations active in health facilities procurement.

Innovation and best practice

New methods of treatment and emerging technologies mean that health environments are constantly facing new challenges. Cultural, workforce and qualitative expectations drive change in design. To understand this evolving health infrastructure and reflect best practice, we arrange study visits to health facilities at home and abroad, which keep our members apprised of the latest ideas and innovations.

Nurture and learning

Designers care for the future. AfH is collaborating with schools of architecture and design to proactively support the inclusion of healthcare-sector buildings in the curriculum. We have a well-established programme of Student Design Awards, which is now in its 11th year.

You can follow AfH on Facebook and LinkedIn. For more information, please visit: www.architectsforhealth.com/join/

SALUS Global Knowledge Exchange

SALUS is an entrepreneurial global media, research, publishing, events and training organisation with a vision to improve human and environmental health through the global exchange of knowledge.

Our mission is to create, share and disseminate knowledge about the relationship between human health and the natural, built and social environments – with a focus on SALUS (Science, Architecture, Lifestyle, Urbanism, Sustainability).

We believe that the two great challenges of our age – the need to maintain and improve human health in the face of ageing populations and chronic disease, and addressing climate change through more sustainable management of the earth's finite resources – are inextricably linked.

SALUS aims to build interdisciplinary professional communities and networks that will facilitate collaborations through a range of media, publishing, events and training activities, which promote the application and interaction of art, science, research, culture and innovation.

Conferences, seminars and workshops

The focus of all SALUS events is on the development of knowledge and sharing of ideas, since we believe that interesting and inspiring content attracts leaders and innovators. By bringing expert researchers, policy advisors and practitioners together to tackle the key health and climate change issues facing the world, we aim to build bridges across geographic, cultural and socio-economic divides, promote and disseminate the latest scientific and research findings, and inspire the commercial development of innovative products and solutions.

This year, we have launched an exciting new event in the public health arena: the Healthy City Design International 2017 Congress & Exhibition (HCD2017). Following a similar model to European Healthcare Design, HCD2017 has attracted almost 100 paper submissions, which the programme committee will shortly consider for presentation at the event on 16-17 October, 2017, at the Royal College of Physicians, London.

Education and training

We also organise bespoke training courses and study visits in the design, health and wellbeing sectors. The courses can be combined with study visits to leading UK hospitals and are primarily provided for international delegates from the health infrastructure divisions of Ministries of Health, as well as public-sector and commercial practitioners.

Media and publishing

With more than 60 years of media and publishing experience within its ranks, SALUS is now embarking on its most innovative idea yet: the launch of a dedicated social media network at www.salus.global. This will provide a new online environment featuring conference videos, posters and papers, an online journal, and a fully searchable projects database, alongside a variety of innovative community features.



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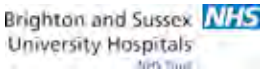
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The new Alder Hey in the Park hospital opened in October 2015, just over a century after the original hospital was built. Alder Hey was the first hospital to: test penicillin; set up a UK neonatal unit; cure the UK's most common congenital heart defect; pioneer a range of splints and appliances; introduce 'liquid glass' to reduce infection; and gain accreditation from the World Health Organisation for public health promotion.

Alder Hey has developed as: a centre of excellence for cancer, and spinal, heart and brain conditions; a Department of Health centre for head and face surgery; a centre of excellence for muscular dystrophy; one of four national centres for childhood epilepsy surgery; a children's major trauma centre; and a centre for research, innovation and education.



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Brighton and Sussex University Hospitals (BSUH) is an acute teaching hospital across two sites: the Royal Sussex County Hospital in Brighton – our centre for emergency, specialised and tertiary services; and the Princess Royal Hospital in Haywards Heath – our centre for elective surgery. These sites include the Royal Alexandra Children's Hospital, the Sussex Eye Hospital, and the Sussex Orthopaedic Treatment Centre.

BSUH provides district general hospital services for 450,000 people in and around the city of Brighton and Hove, mid Sussex and the western part of East Sussex. The trust is planning a £480m redevelopment of the Royal Sussex County Hospital site (the 3Ts Programme), which is the largest publicly funded hospital project in a generation.



Clinicians for Design

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Clinicians for Design (CfD) is an international network of leaders with a vision to inspire and accelerate the design of healthcare environments and systems. CfD offers a forum for clinicians to apply their insights and experience to the design of settings and systems that serve medical practice. Its mission is to engage clinical professionals in research, education and practice, to inform the design of healthcare spaces, delivery, technologies, systems and policies, to enhance patient outcomes.

By tapping into the knowledge of healthcare and research professionals, we may facilitate the next tipping point in medicine and challenge the norms for healthcare design. The integration of healthcare, science and design perspectives will inform the development of tools and a knowledge base that will help shape the future of hospitals, medicine and healthcare.



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Construction Industry Council (CIC)

The Construction Industry Council (CIC) is the representative forum for the professional bodies, research organisations and specialist business associations in the construction industry.

Established in 1988 with just five founder members, the CIC now occupies a key role within the UK construction industry, providing a single voice for professionals in all sectors of the built environment through its collective membership of 500,000 individual professionals and more than 25,000 firms of construction consultants.

The breadth and depth of its membership means that the CIC is the only single body able to speak with authority on the diverse issues connected with construction, without being constrained by the self-interest of any particular sector of the industry.



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Design Council

The Design Council champions great design: design that improves lives and makes things better, improving our built environment and tackling complex social issues.

As an enterprising charity, our work places design at the heart of creating value by stimulating innovation in business and public services. We inspire new design thinking, encourage public debate and inform government policy, to improve everyday life and help meet tomorrow's challenges today.



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Design Quality Indicator

Design Quality Indicator (DQI) is a process of evaluating and improving the design and construction of new buildings and the refurbishment of existing buildings.

DQI is designed to set and track design quality at all key stages of a building's development and incorporates post-occupancy feedback. It plays a fundamental role in contributing to the improved design, long-term functionality and sustainability of building projects.

DQI for Health is used as a design quality evaluation tool for all types of healthcare projects. This specific health assessment builds on the solid foundations of DQI while also incorporating the best features of the now obsolete Achieving Excellence Design Evaluation Tool (AEDET).

DQI for Health includes important topics such as sustainability and patient safety. The update was carried out in collaboration with the UK Department of Health and was piloted with NHS England.



Essentia at Guy's and St Thomas' NHS Foundation Trust

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Essentia designs, builds and maintains healthcare infrastructure vital to the smooth running of healthcare services. Part of Guy's and St Thomas' NHS Foundation Trust, we combine high standards and public-sector values with commercial focus, innovative thinking and modern technology, to create a fantastic patient experience.

Our commercial arm, Essentia Trading, helps clients become more efficient and effective. We provide consultancy and services in areas such as strategy and estates development, sustainability, and IT. We use our experience and expertise, gained from many years in the NHS, to support other bodies – and all profits are reinvested in Guy's and St Thomas'.



European Health Property Network

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The European Health Property Network (EuHPN) is an association of European governmental and research organisations responsible for the strategic asset planning and management of all forms of health property – from hospitals to health centres. The network was established in 2000, in the Netherlands, as a non-profit trust to promote excellence in health property provision and management.

EuHPN holds an annual workshop, hosted in a different country each year. The network also organises regular regional seminars across Europe.



Great Ormond Street Hospital for Children NHS Foundation Trust

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Great Ormond Street Hospital (GOSH) is an international centre of excellence in child healthcare.

Together with our research partner, the UCL Institute of Child Health (ICH), we form the UK's only academic biomedical research centre specialising in paediatrics.



Health Care Without Harm

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Health Care Without Harm (HCWH) Europe is a non-profit European coalition of hospitals, healthcare systems and professionals, local authorities, research institutions, and environmental and health bodies. HCWH has four regional offices: Arlington, US; Brussels, Belgium; Buenos Aires, Argentina; and Asia, Manila, the Philippines. HCWH's mission is to transform healthcare worldwide so that it reduces its environmental footprint, and becomes both a community anchor for sustainability and a leader in environmental health and justice.



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The Helen Hamlyn Centre for Design

The Helen Hamlyn Centre for Design is the Royal College of Art's largest and oldest centre for design research, and is a global leader in people-centred and inclusive design. Our purpose is to conduct design research with industry that contributes to improving people's lives. Our interdisciplinary approach is based around three research labs – Age & Ability, Work & City and Healthcare. Each lab has developed its own innovative research methods, working in partnership with a range of business, industry, government, academic and third-sector partners.



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Landscape, Gardens & Health Network

We are a multidisciplinary community of gardeners, designers, landscape architects, sociologists, therapists and healthcare professionals. We are practitioners and academics who recognise the need to bring all those involved with the healing environment into closer dialogue. Our aim is to provide a central forum for this to happen. We want to break down barriers and promote serious debate about the role of green space in healthcare interventions.



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Maggie's – Official Charity Partner

Providing free practical, emotional and social support for people affected by cancer, Maggie's follows the ideas about cancer care first laid out by Maggie Keswick Jencks. Built in the grounds of NHS cancer hospitals, Maggie's Centres are places with professionals on hand to offer the support people need. Our centres are places to seek advice about eating well; places where qualified experts provide emotional support; places to meet other people; and places where you can sit in peace and quiet.

Our programme of support is based on evidence and has been shown to improve physical and emotional wellbeing during treatment and recovery.



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Medical Architecture Research Unit

MARU (Medical Architecture Research Unit) has more than 35 years' experience in research, consultancy and accredited training for professionals working in the planning, design and procurement of buildings for healthcare. MARU is an educational and research centre of excellence for validated, inter-professional training focused on healthcare provision from hospital to home.

Our vision is to explore the interface between health service organisational culture and the built environment response.



STATE OF THE ART HEALTHCARE TECHNOLOGY

HT Group develops, produces and markets technological, highly-efficient, flexible and future-oriented building and modular room systems in the hospital and laboratory segments worldwide.

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North Bristol NHS Trust

North Bristol NHS Trust provides hospital and community healthcare for the residents of Bristol, South Gloucestershire and North Somerset. The trust is also a regional centre for neurosciences, plastics, burns, orthopaedics and renal.

Completed in 2014, the new Southmead Hospital PFI was completed by Carillion at a cost of £430m. Designed by BDP, the project presents a high-quality public face utilising a semi-randomised façade aesthetic, which gives a non-institutional character to the bedroom wings.



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RIBA Architecture

The Royal Institute of British Architects champions better buildings, communities and the environment through architecture and our members. We provide the standards, training, support and recognition that put our members – in the UK and overseas – at the peak of their profession.

With government, we work to improve the design quality of public buildings, new homes and new communities.

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Sykehusbygg HF (Norwegian Hospital Construction Agency)

Sykehusbygg (Norwegian Hospital Construction Agency) was founded in November 2014 and is owned by Norway's four regional health authorities, which derive their funding from the Norwegian Ministry of Health. The agency's aim is to ensure national expertise for hospital planning, design, engineering and construction at international level. Sykehusbygg seeks to facilitate and contribute to progressive hospital development projects through innovation, experience, standardisation, project management and best practices. The agency must be used by all major Norwegian hospital development projects (over NOK 500 million).

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University College London Hospitals NHS Foundation Trust

University College London Hospitals NHS Foundation Trust (UCLH) is situated in the heart of London and is one of the most complex NHS trusts, serving a large and diverse population. In July 2004, we were one of the first NHS trusts to achieve Foundation Trust status.

We provide academically led acute and specialist services, both locally and for patients throughout the UK and abroad. We balance the provision of highly rated specialist services – particularly cancer services, neurosciences and women's health – with delivering high-quality acute services to our local population in north London.

Our mission is to deliver high-quality patient care, excellent education and world-class research.



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Healthcare design & management magazine

Healthcare design & management (hdm) is an exciting magazine for professionals involved in the planning, design, construction and management of healthcare buildings. Against a backdrop of new operating frameworks and changing models of care, *hdm* covers government strategy, estates management, cutting-edge interior design, and technical insights into M&E, as well as showcasing innovative new products for the healthcare environment. Regular comment from architects and analysts shows how all this fits together to improve the efficiency, accessibility and quality of the patient experience.

Every issue is packed with topical case studies, showing the best ideas in design and most innovative use of materials and technology across all types of health and social care buildings. Product areas range from components making up the building envelope to specification for patient and public areas.

hdm plays a vital role in healthcare design and construction, making sense of the changing models of care and new frameworks that underpin the latest hospital and healthcare schemes. *hdm* is also the industry's leading product showcase, covering the best design ideas and newest technologies, along with provocative views and in-depth analysis of healthcare funding and strategy.



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HealthManagement.org

Dedicated to promoting management, leadership, best practice and cross-collaboration in healthcare, HealthManagement.org (HM) is a digital powerhouse uniting five specialist platforms – Healthcare IT Management, Cardiology Management, Imaging Management, EXEC, and ICU Management – into one.

Receiving 1 million visits a year, the web portal also serves as a leading healthcare news platform, providing comprehensive information on clinical practice, hospital administration, research, technology, and major challenges faced by practitioners. Valuable management tips are also provided via its dedicated channel e-newsletters.

With a circulation of 60,000-plus and free distribution at major healthcare events worldwide, the associated printed publication, *HealthManagement.org – The Journal*, focuses on topics including management, healthcare governance, quality and safety, patient empowerment, and best practice.

Benefiting from the support of more than 50 professional associations, *HealthManagement.org – The Journal* is seen as an invaluable source of healthcare management information, with 40,000-plus articles in its online library. HM also serves as Europe's top leadership and best practice forum, boasting a faculty membership comprising about 50 countries.

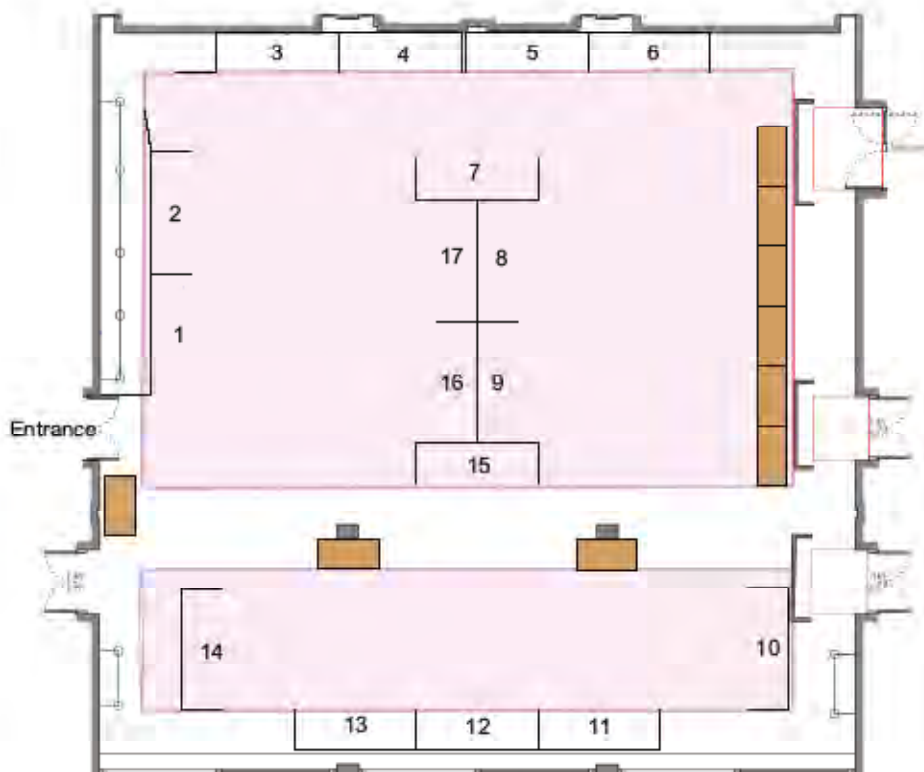
OPENING TIMES:

Monday 12 June 10.00-17.00

Monday 12 June 18.00-20.00

Tuesday 13 June 10.00-17.00

Please take time during the coffee and lunch breaks set aside for networking to visit the exhibition and explore some of the innovative and creative design solutions featured by organisations from the commercial, non-profit and media sectors that are making a significant contribution to healthcare design across Europe and the world. The exhibition will also be open during the welcome reception drinks on the evening of Monday 12 June.



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AECOM

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AECOM

Consistently ranked as one of the world's leading healthcare and science designers, AECOM is sought after to provide its services for highly respected providers worldwide. Drawing on the expertise of professionals in 150 countries, the vision of its healthcare practice is to create smart environments and systems that are people-centred and focused on improving health outcomes.

Its teams are engaged across the entire health economy, from scientific research that enables the delivery of modern healthcare, through to acute hospitals, mental health facilities and aged care. Its healthcare professionals understand the challenges faced by care providers. Their skill is to translate the latest research and practice to generate smart ideas that go beyond the boundaries of conventional disciplines to improve people's health.

Art in Site

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Art in Site

Art in Site was founded in 2003 to help change the culture of care. We transform the way art is incorporated into healthcare spaces. We know that improving the environment of the hospital improves the outcome for the patient. We make space for the patients to feel included in the building and embed, in the fabric of the hospital, a feeling of reassurance and being looked after.

We are an expert team of consultants, artists, designers and production managers completing each aspect of the work in-house. Our early involvement with architects and our clients' design teams, in developing effective art and wayfinding strategies, helps build strong foundations, on to which our creative designs can be based. This collaborative approach enables us to develop truly embedded schemes, where colour, texture and art underpin the hospital experience, so that the patient is at the heart of the building.



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Axis Automatic Entrance Systems

Since Axis designed, developed, manufactured and installed the innovative Flo-Motion manual sliding and bi-parting doors at Alder Hey Children's Hospital in 2015, the doors have been installed in another 10 hospitals throughout the UK, with many more projects in the pipeline.

The Flo-Motion design has evolved to include a telescoping version to increase options in retrofit environments. The option of using smart glass, instead of integral blinds, has also been added to selected products. Actual testing of the doors currently installed shows a required average force of just 10N. Flo-Motion doors can provide large clear openings, which also offer brightness and airiness but have privacy capability when needed. Most importantly, they can be easily opened and closed by a child.



Contact:

Graham Spence, commercial director

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KNOWLEDGE PARTNER

CHP

We help the NHS transform its estate so that it's better for patients, staff and the public purse. We use our specialist expertise in planning to get the best commercial deals for both patients and taxpayers, and design and deliver award-winning buildings. Fully owned by the Department of Health, we have a strong track record of supporting the NHS family by offering a blend of investment, property management, and strategic estate planning expertise.

CHP was created to drive the NHS Local Improvement Finance Trust Programme (NHS LIFT), established in 2001 to deliver public-private partnership (PPP) schemes and improve primary and community-care settings. Partnership working is at the heart of everything we do, and we are working with partners across all sectors to improve services on the ground. We have delivered 339 healthcare developments, from new builds to revamping and maximising existing estate.



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EXHIBITION PARTNER

Gerflor

With more than 70 years' experience of innovation, driven by substantial investment in research and development, Gerflor is one of Europe's largest manufacturers of vinyl flooring. Offering solutions for flooring, walls and corners, Gerflor provides a seamless and holistic surface-protection approach for healthcare facilities throughout the UK and worldwide.

Gerflor has a global presence with manufacturing facilities, offices, and logistical hubs on every continent. Designed to be future-proof, and backed by high-quality research and development, Gerflor products offer excellent long-lasting performance in a wide array of colours and designs to maximise specifiers' options. Durable, high-performing, inspiring, environmentally-friendly solutions are reinforced by dedicated customer, technical and service support teams, as well as a quality-assured installer partnership network.



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EXHIBITION PARTNER

V. Guldmann A/S

V. Guldmann A/S was established in 1980 by Viggo Guldmann, with the concept to develop, manufacture and market technical aids for the disabled and working tools for their carers. Today, we supply products and services in two main areas and under the following two trademarks.

Guldmann – Time to care: We provide a comprehensive, modular range of lifting and moving solutions, drawing on years of experience supplying assistive technology products designed to help people live their lives to the full.

Stepless – Accessibility for all: Stepless offers a broad range of products in the field of accessibility, for use in both private and public buildings. Stepless ramps and lifting platforms give the walking-impaired and wheelchair users physical access to the outside world. These products make life easier for users and their caregivers.



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KNOWLEDGE PARTNER

HDR

We use the power of design thinking to re-imagine space, environments, programming, planning, operations and function. We blend our deep knowledge of healthcare delivery with our understanding of how environments can shape behaviours and outcomes to create solutions for clients that respect the human impact of their work – solutions that champion human-centred design, solve real problems, make lives better, and advance wellness, wellbeing, healing and cures.

Through design and consideration of three important elements – patient care, context and community – we are working to reshape the way healthcare is perceived and delivered. Advancing health and wellness on a global scale and in local communities is at the heart of our endeavours.



Contact:
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KNOWLEDGE PARTNER

HLM

HLM is a leading design practice with headquarters in the UK, offering a rare combination of design skills from the four strong and integrated elements of our business: HLM Architects, HLM Landscape & Urban Design, HLM Interiors and HLM Environment.

HLM is a creative organisation with significant experience in the design and procurement of healthcare buildings in the UK and internationally. We recognise the importance of design quality, sustainability and innovation in creating truly therapeutic environments. We have a proven track record and expertise in the design and procurement of all types of healthcare buildings, from the masterplanning of large sites to the configuration of individual rooms in acute, primary care and mental health settings.



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EXHIBITION PARTNER

HT Group

Together with its subsidiaries, HT Group is one of the world's largest manufacturers of modular room systems for specialist hospital departments, including operating theatres, ICU, decontamination, angiography, and CAT3 and CAT4 laboratories.

Established in Bavaria in 1963, HT installs more than 300 operating theatres every year across the globe. HT is an innovator and at the leading edge of specialist clinical room technology. We can help reduce both the design and build phases, as well as deliver savings in time and money.

Our modular products and solutions give you more flexibility to respond to future developments in medicine and technology, and our knowledge and experience in this specialised field are unsurpassed. From initial visionary concepts to working out the smallest of details, to delivering individual components or a complete turnkey package, we strive to deliver the very best for our clients and our environment.



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 **AWARDS PARTNER**

Integrated Health Projects

Integrated Health Projects (IHP) is a leading provider of healthcare solutions. A fully integrated joint venture, IHP combines the stability, capacity, coverage and experience of Vinci Construction UK and Sir Robert McAlpine. Both are major organisations working in the UK and abroad, focused on development, construction and facilities management.

IHP was formed in April 2003 to act as a principal supply chain partner (PSCP) for ProCure21/21+/22. We have since delivered on 120 projects, valued at more than £1bn. We are committed to achieving the benefits available to NHS clients through ProCure22, working with them to provide better value for money through sustainable solutions, which offer capital, operational and life-term efficiencies. We bring the technical expertise, robust cost control, and programme management skills needed to safely deliver good value, high-quality facilities on time and within budget.



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 **EXHIBITION PARTNER**

KwickScreen

We transform buildings by making spaces flexible, enriching their beauty, functionality and efficiency, with portable, retractable, printed partitions. KwickScreen was designed by Michael Korn at the Royal College of Art in 2007. It went on to win a number of awards, including the Helen Hamlyn Design Award for Creativity and BBH awards.

Considered the world's most compact hospital partitioning system, KwickScreen is used in more than 150 NHS trusts as a solution to mixed-sex accommodation, privacy and dignity issues, infection control, curtain replacement, as well as improving the patient environment. The new KwickScreenPro can be wall-mounted or portable with removable, printed inner panels, which transform clinical settings and improve their use.



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 **KNOWLEDGE PARTNER**

Llewelyn Davies

The original partnership of Llewelyn-Davies Weeks was founded in 1960 by (Lord) Richard Llewelyn-Davies and John Weeks, both innovators in the design of flexible, highly serviced environments.

Llewelyn Davies has since pioneered new thinking in the planning and design of health and science buildings, delivering more than 250 health projects in 75 countries, by employing an adaptive, intelligent approach to create high-value solutions for complex building types.

Llewelyn Davies is also established as one of the UK's leading masterplanners. From Milton Keynes to the urban renaissance agenda, through policy guidelines and development strategies, the company has influenced the UK's vision for planning and design. The international export of this knowledge has led to commissions for Llewelyn Davies in six continents.



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Medical Architecture

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 AWARDS PARTNER

Medical Architecture

Medical Architecture is a multidisciplinary healthcare architectural firm. Founded in 1991, we have a special focus on the health sector, providing a full range of services from envisioning, strategic and clinical planning, estates development planning, architecture, interior design and post-occupancy evaluation. The practice is based in the UK with offices in London and Newcastle upon Tyne, but we work locally and globally, with projects in Australia, North America, Africa and Europe.

nora[®]

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 EXHIBITION PARTNER

Nora Flooring Systems UK

A market leader in rubber floor coverings, Nora Flooring Systems offers a diverse range of environmentally friendly floor solutions. With strong eco credentials, low maintenance and a long lifecycle, these floorings are seen as the best long-term solution for all types of healthcare project. The company provides a flooring system that is quiet, safe and comfortable underfoot, while being permanently resilient and helping reduce fatigue and bodily strain on backs and joints. The floorings have extremely low VOCs, which aid indoor air quality and support the healing process, creating a sense of comfort for patients, staff and visitors. The floorings are high-performance products, which are very easy and cost-effective to maintain and require no coatings.

PERKINS + WILL

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 BRONZE PARTNER

Perkins+Will

Perkins+Will is an interdisciplinary, research-based architecture and design firm established in 1935. With over 2000 professionals across more than 20 global offices, our work has helped shape many of the world's most progressive academic medical centres, research institutions, and hospitals. Spanning masterplans, freestanding buildings and renovations, the breadth and quality of our portfolio have consistently placed us among leading healthcare design firms globally. Through our Human Experience Research Lab, we proudly support Clinicians for Design (CfD), an international network with a vision to enrich the healthcare experience – see page 187.

Pineapple

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 EXHIBITION PARTNER

Pineapple Contracts

More than 40 years of experience have given Pineapple a knack for solving problems in care-giving environments.

Our goal is to create innovative products that help staff provide superior care, while preserving a modern, stylish aesthetic that helps transform environments and improves patient experience.



Healthcare buildings: what is being built and how?

Creative marketing opportunities

The patient experience in hospitals and healthcare facilities distils to four key areas - arrival, waiting, treatment and recovery. Products and services that improve quality, comfort, flexibility and effectiveness in these areas are much sought after by readers of **hdm**, who are responsible for designing and building the majority of healthcare projects across the UK.

To receive **FREE** and regular copies of **hdm** magazine go to www.healthcaredm.co.uk and register for your personal copy.

For additional information on how you can target the unique circulation of **hdm** please contact:

Leslie de Hoog - National Sales Manager
on **020 8288 1080**
or email leslie@stable-media.co.uk

healthcaredm.co.uk

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EXHIBITION PARTNER

ProCure22

ProCure22 (P22) is the Department of Health's (DH) construction procurement framework for the development and delivery of NHS and social care capital schemes in England. The third iteration of the DH framework, P22 provides design and construction services for use by NHS and social care bodies. The six P22 Principal Supply Chain Partners are: BAM Construction; Galliford Try HPS; Graham Construction; Integrated Health Projects; Interserve Construction; and Kier Health.

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BRONZE PARTNER

Sir Robert McAlpine

Sir Robert McAlpine is a leading UK building and civil engineering firm. We combine outstanding technical expertise with the personal touch that comes with being a family-owned firm. Our international portfolio of healthcare clients and projects reflects our delivery expertise and proven track record in providing value for money.

As a joint venture partner in Integrated Healthcare Projects, we have been – and are – a key member of the ProCure 21, 21+ and 22 NHS frameworks. We also have a special relationship with Maggie's, acting as construction partner on new capital investments, sharing fully in the ethos and providing cost-effective practical solutions for construction challenges.

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KNOWLEDGE PARTNER

Stantec

Stantec is a leading design firm with offices in the UK, US, Canada and MENA. Our London studio specialises in the architecture, planning and interior design of healthcare and academic research buildings. We design places that sit at the heart of a community's health – healing spaces that are safe, open and honest. Our cancer centre at Guy's Hospital exemplifies these qualities. Principles of placemaking, sustainability and change adaptation are central to our approach. We are passionate about using excellent design to transform healthcare environments and users' lives.

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EXHIBITION PARTNER

Teal HealthCare

Teal HealthCare is an award-winning provider of innovative patient seating, ward furniture and specialist healthcare products, with a focus on ergonomic design, infection management, postural support, and pressure care. It is a major supplier to the NHS with success in delivering large refurbishment and new-build projects. EHD marks the launch of the Gemini patient chair, with full feature set, including a removable seat, slim profile, and infection-management features. 'Roku', a durable, fully sealed, moulded tub chair, suitable for multiple healthcare settings, will also be highlighted, along with the 'Astra Club' range – a new compact patient recliner for use in day patient and older people's facilities – and Affiniti, a one-piece moulded locker with infection-control features.



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EXHIBITION PARTNER

Veritas Medical Solutions

Veritas is a world leader in the design, production and installation of pre-engineered radiation-shielded treatment facilities. It serves the radiotherapy, oncology, medical imaging, and industrial inspection industries, plus other sectors requiring specialised radiation protection. Veritas also provides radiation-shielded entry doors, room interior packages, and deliverable modular treatment facilities.

The company brings together, in-house, all the elements necessary for designing and constructing a shielded radiotherapy centre, and provides these services as part of a pre-engineered package. On every project, Veritas offers physics, engineering, architectural design, and project management services. Through its ongoing product and service development programme, Veritas strives to provide the most suitable, economical and functionally efficient systems possible.



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BRONZE PARTNER

WSP

WSP is one of the world's leading engineering professional services consulting firms. We bring together a pool of technical experts and strategic advisors, including engineers, technicians, scientists, planners, surveyors and environmental specialists, as well as other design, programme and construction management professionals.

The depth of our expertise and advice spans several sectors, including: property and buildings; transportation and infrastructure; environment; industry; resources; and power and energy, as well as project delivery and strategic consulting services. With around 36,500 talented people in 500 offices across 40 countries, we are well positioned to deliver successful and sustainable projects, wherever our clients need us.



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EXHIBITION PARTNER

Visualite

Hospitals and dental practices can often look bare and sterile, with patients understandably feeling anxious and distressed. But add an illuminated night sky or a beautiful outdoor landscape to a patient ward or treatment room, and that space then transforms into a much more pleasant and relaxing environment; all this can be incorporated into the light source and become the main focal point of any room.

Visualite's clinical lighting solutions are powered by spectacular edge light technology, use non-ferrous fittings, and can be combined with a vast array of bespoke stunning visuals. Reports indicate that MRI facilities with a Visualite Sky Ceiling installed can reduce instances of claustrophobia, as well as increase efficiency. The outcome is an amazing lighting effect, which significantly helps reduce anxiety and enhance the wellbeing of the patient.

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